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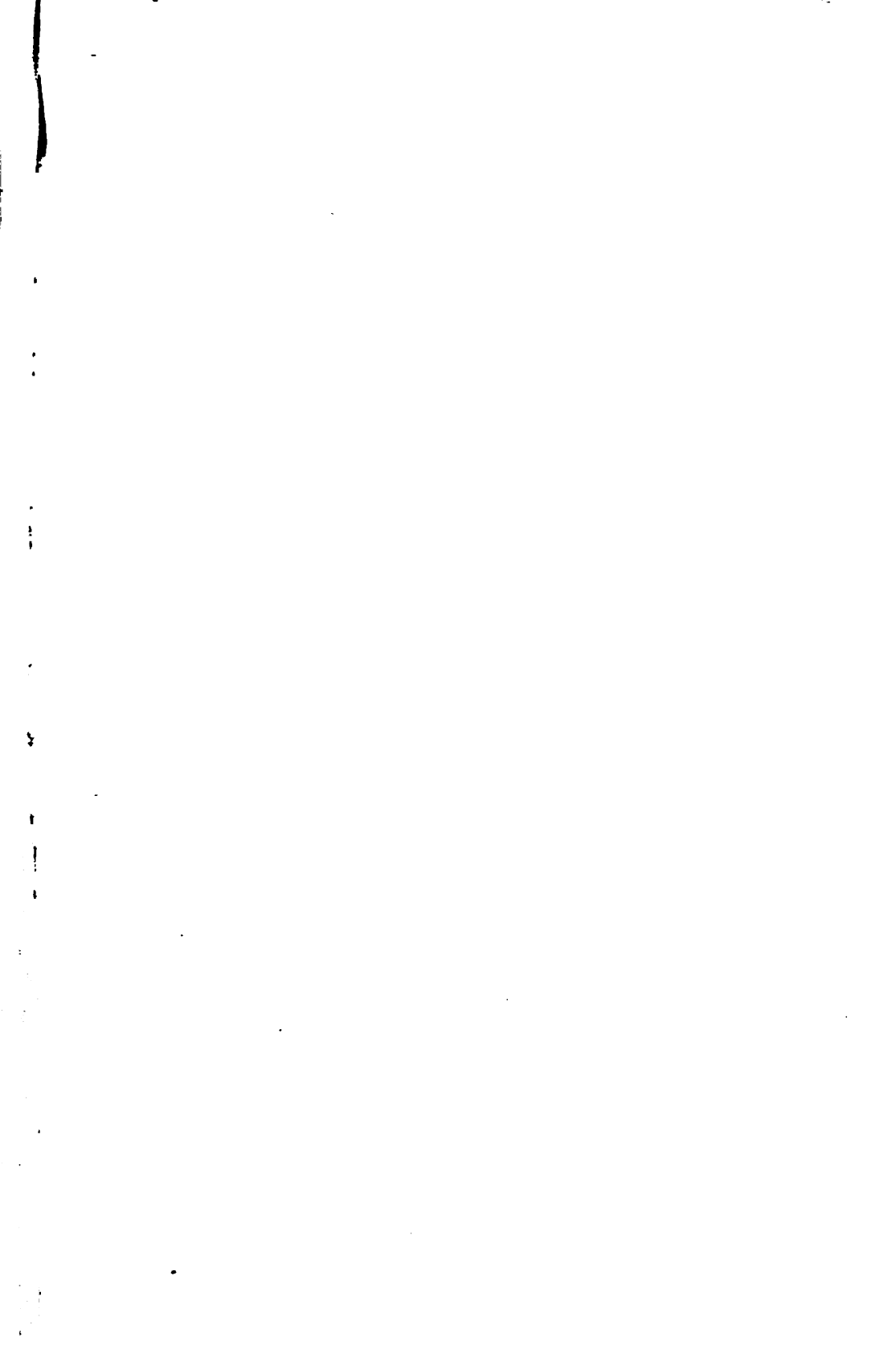
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KENNEL DISEASES.

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ASTOR, LENOX AND
TILDEN FOUNDATIONS.



INFLAMMATION OF THE STOMACH.

KENNEL DISEASES

THEIR

SYMPTOMS, NATURE, CAUSES, AND
TREATMENT

BY

"ASHMONT"

AUTHOR OF "KENNEL DOGS"

LITTLE, BROWN AND COMPANY



PERFORMANCE OF THE DANCER

KENNEL DISEASES

THEIR

SYMPTOMS, NATURE, CAUSES, AND
TREATMENT

BY

"ASHMONT"

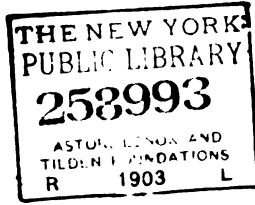
AUTHOR OF "KENNEL SECRETS"

BOSTON

LITTLE, BROWN, AND COMPANY

1903

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PREFACE.

"Dogs : Their Management and Treatment in Disease" was my first literary effort ; hence its many crudities and glaring typographical imperfections. And although kindly received by dog fanciers in every English-speaking country, and translated in several others, I have never been satisfied with it, and determined to rewrite it my first opportunity. That did not present itself until 1898. Beginning the work then, I devoted four whole years to it, and had nearly reached the end, when I experienced a series of misfortunes which prevented further progress for many months.

In attempting to popularize medicine — for the guidance of non-professionals — a common fault seems to be failure to particularize, and thus leave far too much to conjecture. In endeavoring to obviate this I may have gone over the line, and indulged in what might seem to some to be needless repetition. But if so, no real harm can have been done ; and in the matter of doses, especially, my readers can scarcely go wrong.

There are no specifics in canine practice. That is, no medicines which are sure cures, always, for the same diseases. Indeed, in many instances, a medicine which has cured a large number of cases may prove valueless in the next case, although it might seem precisely like the others. Again, oftentimes cures can be effected only in stages, as it were. That is, one class of drugs will accomplish a certain amount of good, and no more, and another class must be employed to secure greater gain. And so on ; it being necessary often to resort to quite a large number of medicinal agents of radically different action before cures can be reached. Manifestly, therefore, he who undertakes to treat obstinate diseases especially should be fortified with as large a number of remedies as possible, that he may promptly substitute for it if one proves disappointing. This accounts for the different measures of treatment that I have recommended in so many instances, and always where difficulty is likely to be encountered.

Although about all the diseases from which dogs are likely to suffer are discussed herein, also the treatment required, it must not be implied that fanciers

are encouraged to assume the responsibility in all cases of sickness. Indeed, excepting in very mild attacks they should, invariably, seek professional assistance, and always from physicians in preference to veterinarians, unless the latter be exceptionally familiar with canine pathology ; a branch of study which has thus far been very generally neglected by those whose practice is confined to animals.

A word as to the expediency of using proprietary medicines on dogs. It is a fixed fact that with but few exceptions such preparations designed for mankind are rank humbugs ; but, strangely perhaps, those intended for the canine race quite often have some real merit, and might be of material assistance could the cases in which they were to be given be properly selected. But they are far from being of equal value in all cases even of close resemblance ; and since their composition is not known, it would not be possible to rightly apply them always ; hence their use cannot be advisable.

Having in "Kennel Secrets" and herein recorded the results of years of careful study of the dog under nearly all conditions, in health and in disease, my work in his behalf is now done. In truth it has been a labor of love, and I lay aside my pen with regret, also the ardent hope that I have contributed to his welfare.

ASHMONT.

April, 1903.

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KENNEL DISEASES.

PART FIRST.

THE SICK-QUARTERS:

THEIR GENERAL MANAGEMENT.

CHAPTER I.

PRACTICAL HINTS ON NURSING.

It is safe to assert that in a very large proportion of attacks of acute diseases, also in not a few chronic cases, the recovery of dogs depends far more upon the nursing which they receive than upon the judicious selection and use of medicines.

Considering the primary essentials, it is important that the room in which the patient is confined be clean, well ventilated, and of the right temperature. If his disease is infectious and he has mates, manifestly he should be taken from them and carefully isolated. As a rule, also, unless the sanitary condition of the kennels is well-nigh perfect, dogs ought not to remain in them while ill, but, instead, should be removed to other quarters that are above suspicion, and to rooms in the homes of their masters when possible, for at such times they sorely miss companionship and frequent expressions of concern.

Those who assume the duty of nursing should be firm, gentle, and patient; and these qualities invariably exhibited, obedience can generally be easily enforced. Whereas roughness, which is often displayed, especially when medicines of very unpleasant taste are being given, has a serious effect on sensitive animals. In truth, ministrations to them should be as gentle and persuasive as to members of the human family under like conditions, for tender solicitude, careful consideration, and a light touch are quite as grateful to a sick dog; while under harsh words and from coarse contact he as instinctively shrinks as his master or mistress must do when ill.

The sick-room should be light and airy; and since the patient will likely be better contented if he can often see those to whom he is devoted, it is generally best to have him located near the family. During cold weather it ought to be heated up to not less than 60° F. Ventilation is always of much importance. In warm weather there can be but little difficulty in securing an abundance of pure air, but in winter, to maintain proper ventilation is much less easy; and there must generally be a surplus of heat, that the air may be kept pure and still be at the right temperature.

The floor should be covered with sawdust, and the bedding be of straw; both of which should be changed once, if not twice, daily. Whether or not there should be a sleeping-bench depends upon the nature of the attack. In some cases a climb of only a few inches would be a hardship; but when allowable it were better that a bench be in use, because of the draughts that circulate along the floor.

In all attacks known or suspected to be of infectious diseases, disinfection should be thorough, and of the air at all times. This may be accomplished by employing dry powdered preparations of lime and carbolic acid, sawdust that has been saturated with some suitable agent, or slaking and boiling lime and water on the stove. Thus many of the spores of the germs of disease will be destroyed; and not only will the chances of the patients recovering be increased, but the danger of their diseases spreading be largely prevented.

In cases of infectious diseases also, the straw and sawdust ought to be burned as soon as removed; and all dishes used in the sick-room be boiled in water, by which means they are rendered perfectly safe. After the sufferers from such diseases have recovered, or been removed by death, the rooms should be faithfully disinfected. The floors, walls and ceiling, and everything therein that is movable, should be washed with a solution of corrosive sublimate, made by adding about one teaspoonful of the mercurial to a gallon of water; and afterward the plastered parts be treated to several coatings of whitewash.

In all acute diseases of the lungs or of their covering, the pleura, jackets made of flannel or out of an old blanket, or of lighter material and quilted with cotton wadding, should constantly envelop the chest, to protect it from danger of chilling. Body blankets, abdominal bands, etc., should always be called into service if they can contribute to comfort or add to the chances of recovery.

Drinking-water should not stand long in the sick-room without being changed, nor ought milk be left there in an open vessel, because both quickly absorb the impurities in the air.

CHAPTER II.

FEEDING THE SICK.

IN the treatment of disease in the human family the present disposition of the most advanced physicians is largely to substitute food for medicine; and the same righteous tendency should exist among those who assume the care of dogs when ill. It cannot with truth be denied that many of the remedies in common use, even in recent years, have been of a nature more or less injurious to the organism, depressing and devitalizing it. The application of them has been in accordance with the Jesuit rule of doing a little evil that good may come. In the more modern practice, however, such chances have not been so freely taken, and the trend has been to do nothing but good to the patient. Hereafter the popular practice promises to be, to try to build up and keep up the sufferers from disease, and trust more to nature to effect a cure; while the classics and venerables, — as calomel, jalap, etc., — once counted by thousands, though possibly used occasionally, will find but little favor. In other words, in the future when treating the sick, foods, not drugs, will be mainly relied upon.

The kind of food needed for the sick is the most nutritious and easily digestible. Here it becomes necessary to digress for the purpose of contrasting briefly the digestive powers of man and the dog. In the former, digestion as a rule is much more rapid than in the latter. Consider, for instance, a moderate meal of fresh, uncooked meat. The average time required for digestion in the human stomach is from one hour to five hours, according to the kind of meat; pig's feet occupying the shortest stated, and pork the longest. But for complete digestion, even of meat that is most easily disposed of, dogs require from nine to twelve hours. As regards the digestibility of the various meats, the same classification and order are alike applicable to both man and dog. Manifestly a very large meal requires a somewhat longer time for digestion than a small one. Fat meat is harder to digest than the lean. With the skin, tendons or sinews, cartilage or gristle, and bones, dogs encounter the greatest difficulty in their attempts to dispose of them. The action of the stomach may be assisted or retarded by the forms in which meats are given. For instance, if they are in large pieces, it is much slower than it would be were they cut finely. A lean and tender meat that has been carefully minced, is digested more easily while in the raw state than it would be were it thoroughly cooked; but when not of that high quality, as a whole, meats are rendered more digestible

by boiling or roasting. It is true that by those processes their fibres are always more or less hardened; but the connective tissue by which those fibres are held together, and which is firm and tough, is softened, so that they are more easily separable from each other, and consequently more accessible to the digestive fluids.

In the human stomach cow's milk is disposed of in about two hours, but in that of the dog its digestion occupies a much longer time. Of well-cooked starchy foods the dog disposes more quickly than of meat. If, for example, he be given a hearty meal of pure and well-boiled starch, in the course of an hour it will have been entirely digested and absorbed. The length of time, however, commonly required by dogs in health for the conversion and digestion of starchy foods generally, as rice and the various meals, is between eight and ten hours.

Returning to a consideration of a dietary for the sick, experience has taught that generally the last food to be refused as the appetite disappears is finely minced, raw, lean beef; and it is safe to assume that for the dog no other form of nutriment is of higher value, nor digested with greater ease, even if the integrity of the stomach is somewhat impaired, unless, perhaps, it be when the lining membrane of that organ is very seriously inflamed. While it remains down—is not vomited—it can be allowed in any case, whatsoever the existing disease; and when it becomes necessary to force food into patients, it may rightly be mainly relied upon to nourish them. In such cases, after being minced as finely as possible, to favor its being given easily it should be rolled into balls of about the size of filberts; and if digestion is weak, as it often is in distemper, it will be advisable to dust over each ball a little of the sugar of pepsin, one even teaspoonful of which would be ample for a feeding.

The whites of eggs require but little if any digestion, and are absorbed shortly after they enter the stomach. They are therefore indicated where the digestive powers are low, and especially if vomiting is frequent.

Milk is generally considered an ideal food. That from cows, as previously stated, is more slowly digested by dogs than by man; and were it solely depended upon as a means of support, the stomach must be kept constantly overloaded. Yet it is an admirable accessory food, and there can be no valid objection to its use in any case. If vomited, it can often be made to remain on the stomach by means of lime-water, which may be added to the milk in the proportion of one-fourth.

Marvellous properties are ascribed to beef-tea; yet in the main, as ordinarily made, it is a stimulant, not a food, all the nutritive properties being thrown away, as valueless. In the section devoted to Distemper, a full description will be given of the proper method of so preparing it that it may have an actual food value.

Liquid foods can often be used advantageously, especially in fevers and abdominal diseases; and it is unfortunate that the number of such that are of real

nutritive worth is so very small. Aside from beef-tea and milk, there is beef-juice, which may be extracted with a common lemon-squeezer, if no better means is at hand. Of the so-called extracts of beef on the market, a few are of some value, but not great, while the majority are nearly worthless. Such being the case, only those recommended by physicians should be resorted to in feeding the sick.

Chicken, veal, and mutton teas are prepared like beef-tea, by substituting one of those meats. They may do for a change, which, however, is not as necessary with dogs as with man. Broths are generally made by boiling the meats for about two hours in water; they are then strained, and the residue thrown away. Prepared in this way they are worse than useless, for the fluid left is a mere extract devoid of all nutritive properties; and it has been proved by a series of experiments that dogs fed on such broths really died more quickly than others entirely deprived of food. Broths should cook until the meats are reduced to a jelly, and never be strained. Only the bones should be removed; and that the liquid may be made more nutritious, it should be thickened with thoroughly cooked barley, rice, or oatmeal. A very appetizing dish may be made of a sheep's head. This, first split lengthwise, should be boiled until the flesh has parted from the bones, and the tough tissues been reduced to gelatin. If much fat appears on the surface it should be skimmed off; and then the rich broth may be slightly thickened with toasted bread, crackers, oatmeal, or anything of the like.

As a rule, dogs are not especially fond of fish; yet the most of them will eat of it readily now and then if properly put before them. Being free from stimulant properties, it constitutes an admirable change for those that have had too much meat; moreover, it is very easily digestible. Some dogs like it boiled and well mixed with vegetables, while others manifest a preference for chowders. The method of cooking is not important, and may be in accordance with individual tastes.

Gruels of oatmeal and Indian meal have some nourishing power when properly made. In cases of great debility it would be advisable to fortify such foods by adding a little sherry or brandy. Gruels may be made more nutritious by cooking the meals in milk instead of water. Flour-gruel is of special value in obstinate diarrhœa. The flour used in making it should be first baked until quite brown.

Raw eggs are among the most valuable resources in feeding the sick. They supply a liquid food which is not only highly nutritious but also easily digestible; and when food must be forced into patients, they may be used quite constantly.

Strangely, boiled liver is often recommended for its presumably remedial effect when the bowels are sluggish. It can only be digested and disposed of with exceeding difficulty, and, as a rule, its laxative action is simply the result of acute indigestion produced by it. Obviously, therefore, it cannot rightly appear on the list of foods for the sick.

In attacks of sickness of only moderate intensity, nourishment can generally be properly given about three times daily; but in severe cases, in which the drain on the system is great, it would scarcely be safe to allow a longer interval between the feedings than four hours, and it may be even necessary to shorten it to two or three hours if the decline in vital powers is rapid and great.

Alcohol and its preparations may without impropriety be alluded to here as accessory foods. Of course they are never to be given to dogs except in very severe cases, in which failure of the vital powers is likely to occur. It is well to bear in mind the fact that the susceptibility to their action is diminished by their frequent use, and after a time increased quantities are required to produce the same effect. Therefore, even where it seems as though they must soon be required, their employment should be delayed as long as possible. In a case of distemper, for instance, in which the indications are that it will be a desperate one, and that stimulants must eventually be resorted to. Now, such being the outlook, the natural inclination would be to commence giving brandy too early; and were that yielded to, the system of the dog might become accustomed to the stimulant, and consequently some of its virtues be lost at just the time when its most powerful and entire effects were most sorely needed. Therefore in all cases the rule should be to withhold stimulants as long as safe, and until they are clearly indicated; or if in doubt as to whether or not that point has been reached, and it is deemed best to commence their use, let the strongest — whiskey and brandy — be reserved against the time of greatest danger, and only wine be given.

It is often a disturbing question, "Which is the best in sickness, whiskey or brandy?"

In this country it is far more difficult to obtain brandy in pure form than whiskey, therefore it were safer to trust to the latter. While of the different wines, sherry is likely to prove much the best.

CHAPTER III.

MEDICINES AND THEIR ADMINISTRATION.

MEDICINES may be introduced into the system in various ways, — through the skin, the mucous membrane, and the subcutaneous tissue. When simply placed in contact with the skin there is but very little absorption. That process is hastened somewhat when friction is employed; and it is much more rapid if the cuticle is removed. The introduction of medicinal agents by means of raw surfaces was formerly practised quite extensively, but at the present time it is seldom resorted to. The fact that more ready absorption occurs when the skin is off, has been wounded, or broken — as in eruptions — should be remembered in using ointments or lotions which have poisonous ingredients. Liniments should also be used cautiously when the skin is not perfect, for those commonly employed contain agents that are stimulating and irritating, even if not poisonous; and such must cause at least very painful smarting. Subcutaneous or hypodermic injections are administered to relieve pain and when it is highly important that the effects of the medicines be obtained as soon as possible. Dogs vomit with such exceeding ease, this method of using drugs which must remain in the system and can be so introduced recommends itself as most efficacious; and all owners of large kennels may properly be encouraged to have always in their medicine-chests a hypodermic syringe, together with tablets of the medicines that are likely to be required in emergencies, especially apomorphine.

Medicines introduced under the skin act more powerfully, as well as with greater rapidity, than in any other way; and the pain caused by the prick of the hollow needle of the syringe is but slight. Considering the first fact, manifestly it would not be advisable to administer subcutaneously more than one-half the dose that could safely be given by the mouth. It is scarcely necessary to add that the hypodermic syringe is an instrument capable of doing the greatest possible harm, therefore it should never be resorted to by non-professionals who have not been first properly instructed in its use; and even with them it should be restricted to desperate cases in which delay is likely to prove fatal.

Some constitutional as well as local effects may be obtained from inhalation. In this way insensibility is induced by chloroform and ether, and spasms are relaxed by nitrate of amyl. Aside from these agents, there are but few that

can be similarly employed, except by means of an atomizer, in the form of a spray.

The most common mode of introducing medicines into the system is through the mucous membrane, and generally that of the stomach. They are taken in the solid state, as when in powders, pills, wafers, or capsules; in the form of mixtures, in which a solid is suspended in a liquid, or one liquid is mechanically mixed with another, in which it is insoluble; or in a state of solution, under which may be included the various forms of decoctions, infusions, wines, syrups, etc. For medical purposes very many drugs in common use are reduced to extracts. These contain much of the active principles of the substances from which they were obtained, the most of the inert matter having been removed in the process of evaporation. By this mode of concentration a very large proportion of the remedial agents can be given in the form of small pills, tablets, or granules; and such greatly favor convenience in the treatment of dogs, since they can be easily concealed and given in small toothsome morsels of meat, etc. When large doses are required, and of agents that are of very unpleasant taste or smell, they can be enclosed in wafers of rice-paper, or, better still, capsules of gelatin; either of which will dissolve readily, and liberate their contents in the stomach. In decoctions the soluble constituents of substances have been extracted by boiling in water. Infusions or teas are similar preparations made with hot or cold water, without boiling. Spirits are the alcoholic solutions of volatile principles, formerly, in general, procured by distillation, but now frequently prepared by simply dissolving such principles in alcohol of full strength or diluted. Tinctures are solutions of medicinal substances in strong or diluted alcohol. In fluid extracts are concentrated the active ingredients of drugs. A saturated solution is one that contains all of a given substance that can be dissolved in the quantity of liquid used. An emulsion is a mixture of oil and water, made by using gum arabic, sugar, the yolk of an egg, or other like viscid matter.

There are a few drugs that have a greater effect on dogs than on man; there are also some to which the former are decidedly less susceptible than the latter. Mercurials illustrate the first class, and opium, with its products, the other, — exceedingly large doses of that drug, which would be sure death to man, being often taken without any visible effect.

Considering the relative doses of medicines generally appropriate for an adult, mature dogs of the largest size — as mastiffs and St. Bernards — may, as a rule, safely be given the same quantities; while about three-fourths of those quantities would be right for dogs of medium size, as setters and pointers, one-half for fox terriers and the like, and one-fourth for toys.

The age is of course an important consideration in the use of drugs; puppies requiring much smaller doses than mature dogs to produce an equal effect, while the very aged cannot bear as large doses of powerful medicines as they might have

safely borne while in middle life. And indeed there are drugs, notably arsenic, which have such an unfavorable influence on old dogs, that unless all other means have been first tried and failed, they should not be resorted to.

The foregoing rule governing doses is for mature dogs. While the maturing period differs in the various breeds, in graduating doses it is safe to consider as mature all that have passed the tenth month. Thus to a St. Bernard even only a few days over ten months of age can be given the same quantity or dose of a medicine that would be right for an adult.

Habit materially modifies the effects of most medicines. That is, the system becomes accustomed to them, and after a time dogs can bear larger doses than at first. In this connection it is important to remember that when a medicine has been gradually increased, and then discontinued for two or three weeks, the system, soon renewing its susceptibility, is no longer tolerant of very large doses; and if that same medicine is to be again given, a return should be made to the smallest and commencing dose, otherwise the result might be harmful.

Almost all drugs act more powerfully on an empty stomach than when it holds solids or fluids; but some are too irritating to be so given. Arsenic, iron, and cod-liver oil should always be administered at the time of, or immediately after, eating, to mingle and be slowly absorbed with the food. When the directions are not ample, and one is in doubt as to the proper time for giving other medicines, let it be between meals, — neither just before nor just after feeding. Oil can generally be best administered while floating on milk. All pills, granules, or powders that can be concealed in a little meat, should be so treated. Fluids of strong taste should be invariably diluted with water; while the quantity of the latter used is a matter of no special consequence. Quinine coagulates milk, therefore it should not be given with that food, nor near the time of taking it. All mixtures should be shaken before the bottles containing them are opened. No liquid medicines should be allowed to stand uncorked.

Time being often of the utmost importance, and since a simple remedy applied at once may avert grave results, it is advisable that all large kennels be provided with certain drugs with which to meet emergencies. Only a small number will be needed, and the boxes and bottles containing them should be conveniently arranged and distinctly labelled. Among the medicines which may properly be selected are, the powdered sulphate of copper, — an emetic, — half an ounce; castor oil and sweet oil, of each four ounces; a small piece of caustic fastened in a quill, and enclosed in a well-corked bottle; a mixture, of equal parts by weight, of Canada balsam and carbolic acid crystals, about half an ounce — for sudden breaking-out and intense itching; flowers of sulphur, half a pound; a small jar of vaselin or petrolatum; several light-colored areca nuts; a syringe, and clinical thermometer. After familiarizing himself with the measures recommended for the various diseases to be discussed hereafter, the reader may deem it wise to make a few additions to this list.

In purchasing medicines, the most reliable dealers should be patronized. It is not economy to buy drugs where they are very cheap, for such purchases are quite sure to be old, of a low grade, or adulterated; while the compounding of prescriptions should be intrusted to apothecaries of known competency only.

Let it be remembered that nearly all mixtures undergo changes in time; therefore it is wise always to have only small quantities prepared; also to throw away what remains of mixtures of medicines at once after their use is permanently stopped.

As previously advised, if possible, medicines should be concealed in toothsome morsels of meat or disguised in milk or broths. When this is not possible, and force must be used in their administration, if kindness and patience are exhibited, the operation ought not to prove difficult. Where the medicine to be given is in the form of a bolus or large pill, this method may be employed: Grasp the muzzle of the patient firmly with the left hand, the thumb and forefinger on either side pressing in the upper lips, covering the teeth and thus preventing the dog from biting. His mouth being opened and head elevated, carry the pill back into the throat as far as possible, and shut the jaws. If he does not swallow immediately, he will do so as soon as his nostrils are closed and breathing through them is stopped.

When liquids are to be administered, it is generally necessary to have an assistant. He who gives the medicine should sit on a chair, and have his clothing protected by means of a large napkin or apron. With the dog between his legs, back towards him, he should hold the animal's head with his knees, and firmly grasp his muzzle with the left hand, so as to keep the jaws and teeth together. Now with the forefinger of his right hand he should gently pull outward the lower lip on the corresponding side, that it may form a pouch or sort of a funnel, into which the assistant is to pour the medicine. This he should do slowly and deliberately. The dog's head being held by the knees, in a vice as it were, he cannot shake the medicine out. When the grasp on the muzzle is slightly relaxed he will at once extend his tongue and swallow. If all does not go down at a gulp, the muzzle should be quickly pinched for a moment, and again the grasp be relaxed. And this operation should be repeated until the medicine has all passed into the stomach.

This same method may be employed in cases in which the dogs are unconscious and cannot be made to swallow, for the fluid will safely trickle down the throat if only a little at a time be dropped into the improvised funnel or cup.

When the medicine is of very unpleasant taste it is advisable to keep the patient's head elevated for several minutes, to prevent vomiting.

To endeavor to give medicine from a glass bottle, the neck of the same being forced into the patient's throat, is a somewhat dangerous practice, therefore cannot be recommended.

Injectations by the bowels are sometimes called for in obstinate constipation;

and they must generally be the form of treatment to be applied in convulsions. It may be necessary also to give injections of food and stimulants in cases of extreme debility and when the patient cannot be persuaded to take nourishment.

Although syringes of glass, capable of holding about two tablespoonfuls of fluid, will commonly suffice for the giving of medicines, for general use a syringe made of hard rubber and of a capacity of from one-half to one cupful is the best, and indeed the most economical, because it cannot be easily broken.

Water alone may relieve constipation, but soapsuds are more efficacious. Or olive oil may be used. The quantity of either is not important; and an ordinary syringeful may be injected, even if the instrument be quite large, for an injection of from half a pint to a pint cannot do any harm. Glycerin acts well in constipation. Of that large quantities are not required, and from two to four teaspoonfuls usually have the desired effect. All fluids injected should be about "blood-warm." If turpentine injections are required, that medicine should be well beaten up with the white of one or more eggs. Any highly concentrated food can be given by injection if required. Milk, cream, strong beef-tea or beef juice, and raw eggs well beaten, are among the most suitable. Stimulants if needed can be given alone or with the nutriment; and a good injection is six tablespoonfuls of beef-tea, one tablespoonful of brandy, and the same quantity of cream. If nourishing injections are to be given continuously, one in five or six hours is often enough, and four ounces — eight tablespoonfuls — of liquid the largest quantity allowable. The bowel should be evacuated before nourishing injections are administered; but if they are to be given several times daily, an injection of warm water before the first will suffice for the day. When perfect quiet is enforced, the bowel soon becomes accustomed to the presence of the fluid injected and the expulsive tendency subsides; but for at least ten minutes after an injection has been given the thumb should press firmly over the opening of the bowel, to prevent its contents from escaping.

Suppositories are solid bodies for introduction into the bowel or passage to the uterus; and, as generally prepared, they contain a medicine the peculiar effect of which it is desirable to communicate to the neighboring organs or to the system at large. Cacao butter and wax are the substances of which suppositories are principally composed, and in these are incorporated the medicines which it is desirable to use. When introduced into the bowel, after being well oiled, they should be pushed up the passage, at least one-half the length of the finger beyond the opening.

PART SECOND.

PRINCIPLES OF MEDICINES.

CHAPTER I.

SYMPTOMS OF DISEASE

ALTHOUGH descriptions of the symptoms will occupy a large part of the space devoted to individual diseases, that branch of study is so important that a preparatory discussion of it here, which may also properly include certain principles and general considerations of the natures and causes of diseases, is deemed advisable, since it must favor much better understanding of the subjects when reached.

To define disease is difficult except by negation — which is to say what it is not, instead of what it is. The popular definition, therefore, is an absence or deficiency of health. No practical embarrassment, however, results from this difficulty to draw the line with precision ; for each owner unconsciously fixes an individual standard for his dog, and variations from it constitute disease. In other words, by intimate association with his canine friend he soon knows what in him is the healthy state, and is able to promptly detect when he has left it and is ailing.

In a general way in a healthy dog we note as follows : Eyes bright, the white usually clear, the fine red lines seen at times having no significance ; the lining of the lids a pink, rose tinge. Nose cold, moist, and slippery, except when the animal sleeps ; then often hot and dry. Coat soft and smooth, and in long-haired dogs, glossy. Skin soft, easily moulded, and of a gentle heat. Tongue moist, pink in color, free from coating. Pulse full and strong, ranging from eighty to one hundred, varying in different breeds and natures. The larger animals have a lower rate than the smaller, the nervous a higher than the less easily excitable. Excretions from the bowels vary with the food given in consistency and color. Neither hard nor thin, they should be free from undigested matter, and not markedly offensive in odor. The urine should be pale yellowish, abundant, and freely and easily expelled.

The fact may be properly emphasized here that the canine race, as a whole, is

less susceptible of pain than mankind, and that many members of the former bear the use of the knife with a calm endurance that is simply marvellous. There are certain diseases also which are characterized by pain so intense and agonizing that man cannot possibly bear it, and must be kept constantly under the influence of the most powerful narcotics while it lasts; yet in some instances in which dogs are the victims of those diseases, and precisely the same morbid phenomena are occurring, they do not manifest any sign of severe pain. A notable illustration of this radical difference in constitution as to susceptibility of pain is peritonitis. In several cases also of intestinal stoppage and colic, so severe that death shortly resulted, the author has seen that peculiarity exhibited in marked degree. Although he remained constantly in the kennels of the sufferers until they died, the only evidence of pain that he could detect was a disposition to frequently get up, walk a few steps, and lie down again.

A low degree of susceptibility to pain, is, however, by no means universal in the canine race. With members of the largest breeds it seems to be most pronounced and prevalent. Yet among such there are notable exceptions; and indeed some of them are so acutely sensitive that even a slight pain appears to drive them nearly frantic. This is evidently the rule, also, with pampered pets and the highly vitalized and delicately balanced classes, from which sporting dogs are drafted, and in which inbreeding is quite common.

While on this peculiarity in the constitution of dogs, there suggests itself that very marked difference in the mental make-up of man which has a decided bearing on the subject under discussion. To the credit of mankind be it said that only a small proportion dislike dogs; and fortunately they, individually and collectively, are actual nonentities, and duly recognized as such. Some others have merely a mild fancy for those most loyal of friends, and value them only as they are of use. There remains the by no means small class, made up of so-called "dog-lovers," who exhibit towards their humble comrades much of the right spirit of kindness and devotion. Between dog and master of the latter class there exists a sympathy which, of course, varies more or less in intensity, in accordance with the moral constitution of the man, — as he is shallow and superficial, or capable of great depth of feeling. Let him be possessed of the most beneficent qualities of his dog, and the devotion be mutual, there will then exist between them such a strong sympathy that he must feel, intuitively almost, when his friend is not himself, even if he does not manifest any noticeable signs of trouble; while less fortunate masters, not capable of regard so intense, must very generally labor under serious disadvantage in like cases.

Differences as regards severity and duration constitute a basis of the division of diseases into varieties. As a rule, the same disease may be "acute," "sub-acute," or "chronic." In general an acute disease is of recent origin, it comes on suddenly, and is of sufficient intensity to practically disable the victim. A subacute variety of disease differs from this largely in intensity. It is of mild

form; and while it lasts the patient might without impropriety be considered merely ailing — not seriously ill. A chronic disease is one that is subacute, and has persisted as such for a considerable period.

Proverbially the signs of inflammation, as when a hand or foot is inflamed, are redness, heat, pain, and swelling. The redness is owing to the excess of blood; the heat to the same cause, with also, probably, some increase of chemical change in the part. Pain is not quite so clearly to be accounted for. Pressure on a nerve is known to cause it; and the excess of blood beating on a part at whose centre is stagnation must induce considerable pressure. The swelling of an inflamed part is also due in considerable degree to the accumulation of blood in it; and under the pressure of the heightened circulation some of the watery portion of the blood escapes from the blood-vessels into the substance of the parts affected, and thus contributes to the swelling.

The most common and prominent symptoms that are generally exhibited when an acute attack of disease is on or near are as follows:—

Increase in rapidity of the pulse; a chill, or chilly sensations, and fever; the nose is dry and hot; frequently the eyes are reddened; there may be restlessness, but oftener there is depression and evidences of general weakness; the desire for food is slight, if the appetite is not wholly lost, which is the rule; thirst is almost always present, and the lips and tongue somewhat dry; and in many cases vomiting occurs at least once, while in some it is repeated several times at quite frequent intervals, the matter raised after the first attack consisting largely of mucus or "slime." The quantity of urine discharged is less than in health, and the color of that excretion is darker than normal; occasionally there is diarrhoea, but commonly constipation exists. Some change in the general appearance of the body may take place; and even if an attack has been on but for a few hours it may seem somewhat shrunken, the abdomen be tucked up, the back arched, the head carried stiffly to one side, or other notable peculiarity be presented. The expression is usually greatly changed and indicative of distress. The eyes wear an anxious look, and plead piteously for relief; they also show resentment and even utter despondency when it is not afforded.

Most acute attacks are more or less painful, and if the victims are pampered pets, or very delicately constructed dogs, they likely give evidence of their suffering by whining or short, sharp cries.

In diseases located within the chest, the breathing is modified and generally quickened. In some cases also the respiration is what is termed restrained or cautious, inspiration being shortened by the pain it produces.

In most acute attacks of great severity the condition of the coat and skin speedily changes, and the former, instead of being glossy and smooth, is more or less staring; while the skin, losing its natural softness and elasticity, is soon dry and hard.

Aside from the foregoing symptoms, which, as stated, are exhibited in nearly

all acute attacks, oftentimes signs are manifested which point plainly to the parts or organs affected.

Nearly all deviations from health affect at once two of the most important vital processes, namely, circulation and respiration. Perfect circulation depends upon the integrity of the heart and its blood-vessels, and to ascertain the condition of that organ is the first important step to be taken in the attempt to determine the existence of disease. The pulse is a guide; for its changes perfectly accord with those of the heart, of the action of which it is therefore an accurate index. It varies, however, so greatly even in health, under many different influences, that more than a passing knowledge of its fluctuations is necessary before positive and infallible conclusions can be drawn from it.

At birth the pulse is very rapid, — from 125 to 160. During the first three months the fall is but slight, and the pulse ranges from 115 to 135. Thereafter the decrease is more marked, and about the sixth month the rate is between 100 and 120. Near the ninth month it is between 90 and 100; while at one year the normal pulse is between 70 and 90.

Other facts of interest bearing on the pulse-rate are, that it falls low — between 50 and 60 in the mature — during sleep. It is usually a little more rapid in males than in females; in small than in large breeds; also in dogs of excitable nature than in those of rather dull and sluggish habit; while manifestly the rate is increased by exertion, and the effect of merely getting up is apparent on the pulse.

From the foregoing it must be evident that a rapid pulse only, unless it has kept up several hours, cannot be of great significance in the absence of other symptoms, and especially fever. Clearly, also, by the untrained, but little is to be learned from the pulse of puppies before they are nearly a year old.

The character as well as frequency of the pulse is subject to variations, and it is affected by nearly all abnormal conditions of the body. In some inflammatory affections the pulse is quick, full, bounding, and resists compression; in others it is hard, sharp, and contracted, vibrating under the fingers like a cord. In prostration from disease, in severe disorders of long continuance, and troubles characterized by great nervous excitement, also under the influence of intense fright, it is rapid and weak. In certain brain affections in which there is compression, as apoplexy, the pulse falls much below the normal rate, and is full and throbbing. In diseases attended by marked debility it is soft, and yields readily to pressure. While in exhaustion, the pulse is thin and feels like a thread; and as death approaches it becomes flickering. In occasional cases it drops a beat at quite frequent intervals, — every minute, or even two or three times during a minute, — and while this may indicate grave disease of the heart, as a rule it is merely a functional disturbance due to excessive nervousness, and disappears at once the cause is removed. There are yet other departures from the normal standard, but these already mentioned will suffice as illustrations of its variability.

All who have dogs will do well to study the pulse in health, and become so familiar with it that they may be able to readily detect and appreciate the importance of variations. There are several localities in which large arteries lie near the surface, and the pulse can be easily taken, especially the groin and inside of the fore leg, near the body. Or it can be taken while the hand is on the chest over the heart. To accurately determine the pulse and its character, two or three fingers should be lightly pressed over the artery, and the beats counted for a full minute. If the dog be excitable and a stranger to the operation, his pulse is quite sure to go up; therefore it should be repeated several times. In all instances of suspected ill-health, also, the pulse should be taken at intervals, for the purpose of determining positively whether or not the increase is only temporary and due to excitement, or is in consequence of disease, threatened or already on.

The processes of circulation and respiration are so intimately connected that the influences which modify the pulse also affect the breathing. The number of respirations per minute in a healthy dog is about twenty; and the rate, as that of the pulse, is varied by age, sex, form, exertion, excitement, and many other influences. Not only the frequency but the character of the respiration is subject to variations; and among the terms in use expressive of the different modifications are "regular" and "irregular," "easy" and "labored," "quiet" and "noisy," "deep" and "shallow." "Wheezy respiration" is very common, and generally indicative of nasal obstruction. "Stertorous respiration" is noisy, each breath being accompanied by a snoring sound. In man it is an evidence of profound insensibility; but in some breeds of dogs, as pugs and bulldogs, whose nasal passages are very narrow, it cannot be considered an abnormal sign, while it may be produced in other breeds by nasal inflammation or accumulations of mucus.

Cough is almost always associated with severe disturbances of the respiratory organs, and it may be somewhat suggestive of the existing disease, although not plainly indicative. Accumulations in the air passages are usually expelled during retching or vomiting, and their character would be of significance and assistance in making diagnoses were it possible to determine with certainty whether they came from the stomach or from the lungs.

Much about the bodily temperature and use of the thermometer will appear in the discussion of Distemper. In health it varies slightly in different parts of the body, being about 101° F. in the rectum, 100° in the groin, and $98\frac{1}{2}^{\circ}$ in the mouth. Many disorders of the system are accompanied by decided elevations in temperature. In some these changes are among the earliest, if not the very first, symptoms manifested; and the most pronounced outward signs of them, aside from the heat of the skin, are trembling or shiverings, hot and dry nose, and thirst. In certain diseases, as pneumonia, the rise is rapid and sudden; while in others equally as serious, notably distemper, there may be at first only

slight elevation, and subsequently a gradual rise. Did the fevers from which the canine race suffers assume a regular type, with nearly uniform rise and fall of the temperature morning and evening, complications might be easily detected, evidence of the same appearing in any marked irregularities exhibited by the thermometer. As it is, however, the temperature is less instructive; and only when the thermometer makes sudden and quite long jumps upwards need there be apprehension, from the temperature alone, that there has been an extension of the existing disease, or that some other disorder has started up, to run with it, and make the case more serious. During the course of inflammatory affections, constipation usually sends up the temperature; and great excitement and a variety of other influences may have the same effect; while if pus forms in any considerable quantity, there is sure to be a sudden rise of several degrees.

Chills and rigors, manifested by shivering and trembling, are nervous phenomena; and notwithstanding the victims feel cold, the temperature is rising, and there is fever. Perspiration, the office of which is, principally, to regulate the temperature of the body, is but rarely perceptible in dogs, unless very profuse, when, as a rule, it is caused by extreme weakness. A very high temperature while the skin is moist is much more alarming than the same degree of heat with a dry surface.

The dog vomits easily, and he would seem to often do so even without good reason; but doubtless by that means he saves himself many attacks of sickness, and keeps his stomach and associate organs in much better condition than would be possible without it. Vomiting, therefore, while it might mean much, generally means but little, and alone cannot be rightly considered a symptom of any decided significance unless it has been repeated several times within a short period, when, of course, it is likely serious, and highly suggestive of poisoning.

The fault of attaching undue importance to the appetite in both man and dogs is almost universal. Let it be a little less hearty than usual, or a bit capricious, and straightway bitter tonics are administered, with the purpose of stimulating and correcting it. Whereas, in ninety-nine cases out of every hundred, all the man or dog requires is to be let severely alone for a time, and until his system has righted itself. When that goes wrong, one of the first moves of nature toward remedying the fault is to take away the appetite more or less completely; for not only is food not required then in the usual quantities, if at all, but harm is sure to result unless it be properly restricted or entirely withheld. She decrees a fast for a time; at the expiration of which, if not interfered with, she signifies that all is well by renewing the appetite. To drug for that alone cannot be required in any case if it be otherwise rightly managed, and certainly not in acute or recent attacks. If a dog taken ill suddenly has seemed to have lost his appetite, he should be merely tempted with some bland food, as milk, or possibly a little scraped raw beef, to determine positively whether the fast is designed to be complete or only partial; and the same

method be repeated day after day, or possibly more than once daily. When the right point in the course of his disease has been reached he will eat; nor will he ever require the assistance of bitters or tonics. As for loss of appetite in old chronic cases, there would never be any occasion for drugging on that account could every case be properly understood, the causes determined and removed, and the general management be right thereafter. For a capricious appetite or complete loss of appetite there is a cause; and it may be worms, trouble with the digestive organs, bad air, or any one of many possible faults in management. Now, while that cause exists, to give vegetable bitters, — as gentian, cinchona, etc., — nux vomica, or anything of the sort, is the height of absurdity, and like merely closing the blinds when the furniture in a room is on fire. No great discernment is necessary to recognize the fact that the cause must first be removed. That done, as a rule, the appetite will promptly return without the assistance of stimulants or medicines.

Before proceeding further it is well to urge that when a dog seems to be ailing his owner or caretaker should study him leisurely, for confusion is quite liable to result from hurried efforts to discover the nature of the attack. He should take him to a room where they are not likely to be disturbed, and there sit down and watch him carefully while he moves about at will. And if he is a close observer, rarely will it be long before he detects some peculiar movement which suggests the character of the trouble, or about where it is located.

In determining the existence of a particular disease, aside from the facts to be acquired by a study of the pulse, respiration, and temperature, there are other signs of considerable diagnostic importance to be noted. In the attitude of a dog there are often valuable indications. Thus, if suffering from colic, he will lie on his abdomen, pressure affording him slight relief. But the pain will not permit him to remain long in one position, therefore he soon gets up, takes but a few steps, and is down again. If a lung be affected, in lying down the sufferer usually chooses the diseased side; while in desperate cases of lung trouble, he steadily maintains a sitting position, being unable to breathe when recumbent.

The expression may be of some assistance. If only slightly changed from that habitually worn, the import is favorable, and the conclusion may be that the attack, if recent, is not very severe, at least as yet. In cases that have persisted long, however, the expression is not as a rule changed as much as in others of acute character. In very painful affections, evidence of the suffering experienced is seen in the expression. Rage is plainly depicted at times in rabies. Victims of great debility have a piteous and despondent look. When the mouth is drawn at the corners, the cheeks shrunken, the lips pale, and the eyes glassy, the end must be near; and the significance of these symptoms cannot be mistaken when the surface is cold and clammy to the touch, the respiration labored and gasping, and the pulse thin and thready. Indeed, to the close and intelligent observer, the expression of the dog in disease means much, and is often of very great assistance in reaching a diagnosis.

The eye of the dog in health is rightly said to be full of expression, and some of its changes in disease are suggestive. For instance, in severe attacks in which the fever has run high for several days, the eyes are generally bloodshot, thus showing that an unusual quantity of blood has been sent to the head; or, in other words, it is evidence of a fulness of blood there. When the liver is much at fault, the "whites" of the eyes have a yellowish tint.

In wasting diseases the eyes eventually seem to sink in their sockets. That they cannot bear the light is very evident in cases characterized by irritability of the brain. In inflammation of the brain, also in some other very serious diseases located elsewhere, the eyes are unusually brilliant, and described as glaring. With children, squinting commonly appears in disease of the brain. Very rarely, yet now and then, it is detected in dogs suffering from like trouble. A few hours before death the eyes lose their lustre. In advanced brain inflammation the pupils often contract and become very small. There is often, also, total loss of sight. As a rule, after death by the cyanide of potassium or Prussic acid, they are found widely dilated. In children one effect of large doses of *santonin* is to so change the sight that things look yellow. Now and then, after the drug has been given to pups they act a little strangely, and in ways that suggest that their eyes may have been similarly affected by it.

Dogs often paw at the sides of their heads, and this act may be induced by ear trouble, as *otitis*, an insect or other foreign body in the passage, etc., or it may be prompted by pain or other disorder in the head. The sense of hearing seems to be preternaturally acute in some conditions of the brain, and often precedes wildness and delirium; while defective hearing may be due to congestion or disease of the ears, or to brain trouble. Considering further the symptoms connected with the senses, where tenderness appears on pressure, the common acceptance may be that there is inflammation, although it is present occasionally in neuralgic cases, possibly from inflammation of the sheaths of the nerves. Tired muscles may also be sore to the touch as well as on motion. Pain may sometimes be more or less relieved by pressure, as in *colic*; and in all cases in which it is so affected it may be confidently accepted that there is no inflammation, otherwise pressure would cause pain instead of relieving it.

Loss of sensation occurring from disease constitutes one kind of paralysis, and loss of power to move the parts affected is the other form.

The appearance of the teeth may have some, although scarcely great, importance, for they are very generally neglected. When dogs are scantily fed or otherwise not properly managed, and consequently nutrition is disturbed and poor, the teeth tend to decay. The accumulation of tartar might be prevented were bones judiciously allowed with the food, but, as a rule, they are much too hard to serve their purpose; moreover, teeth are often broken by them. Tartar forms between the teeth and the gums, gradually accumulating at the roots, and they are loosened in consequence, while much irritation is often induced. If his

teeth are bad, the inference may be that the dog is not of very sound constitution and high health, although the trouble may be, as intimated, due entirely to neglect. Sordes are a filthy and foul accumulation about the teeth. They are but rarely seen excepting in severe and long-continued inflammatory attacks.

The tongue indexes not only the state of the digestive organs, but, to some extent at least, the condition of the whole system. In health it is moist and clean, and its covering of pink color. A pasty, white coating is seen in indigestion. In stomach or intestinal disorders of long continuance, but not of aggravated form, the tongue loses a little of its bright red color, and exhibits a whitish or light-brownish coating. In cases of anæmia, or poverty of the blood, the tongue becomes pale. When the stomach is much inflamed, also in cases of poisoning by arsenic or other irritant, the tongue is of brighter red than natural. It is also dry, and may appear a little swollen. A dark brown and almost black tongue is seen in very desperate cases of distemper, and sometimes in other attacks characterized by high and long-persistent fever, also near the end from prostration. In acute affections much or all of the surface of the tongue is covered by the coating, while in chronic cases it is generally seen in spots. Cleaning up of the tongue and disappearance of the coat in disease is very generally a favorable sign; although in some instances in which the course of the malady is a very long one, the tongue clears up, and then the coating forms again. In rabies the tongue becomes swollen, dry, hard, and purplish. When cracked and bleeding, the outlook is very discouraging indeed. While a clean, moist tongue of good color is generally an evidence of good health, there are exceptions to this rule, and occasionally in dogs in poor condition the tongue may show up well.

Swallowing is usually interfered with by slivers of bone in the throat, although it may be difficult in consequence of inflammation therein, or quite impossible because of paralysis. In cases of poisoning by irritants, the lining membrane is of deeper red than normal, and it appears somewhat swollen. In diphtheria the false membrane may sometimes be seen in the throat, appearing like pieces of dirty white kid.

The symptoms presented by the skin are often very instructive, and any considerable deviation from health can generally be easily detected. It is hot and dry in inflammatory affections. When dogs are out of condition and poor in health, even if not victims of any real disease, instead of being soft, smooth, and elastic, their skin becomes dry, hard, and no longer yielding; nor does it slip over the tissues beneath, but instead they are what is commonly termed hide-bound. The color of the skin may be changed considerably in disease. Thus it is paler than normal when the blood is poor or scanty. In jaundice and severe bilious troubles it is yellowish. In pneumonia of desperate type and when suffocation is threatened, it is dingy and purplish or blackish.

The coat is never good while the health is poor, and often it exhibits the

first pronounced signs of loss of condition. While smooth, glossy, full of lustre, and it lays well, the health of a dog must be good, or if he exhibits any abnormal signs they must have been recent, and the chances are that his disturbance is a mild one, and will soon be over. If, on the other hand, his coat is harsh, dry, and staring, he is certainly not in good condition, and must be the victim of actual disease, disorder, or faulty management. Indeed, the coat is such a sure index of the state within, oftentimes seemingly very trifling causes are quite enough to throw it away off in condition. For instance, deny dogs sufficient good pure, fresh drinking-water, and they are certain to fall off in coat, no matter how well they are otherwise treated.

Bluish-black spots, appearing during the course of diphtheria or other serious disease of long continuance, are ominous; indicating a hemorrhagic tendency.

The passage of darker-colored urine during acute attacks means merely that that excretion is condensed and concentrated, an uncommon amount of the watery constituent being disposed of in the body by the unusual heat. An excessive amount of urine suggests diabetes. Straining while emptying the bladder may be due to inflammation of the same or to prostatic trouble. Retention of the urine may be caused by obstruction, or by loss of power, — paralysis. The appearance of the urine may change very greatly and yet the subject remain in good health. That is, it may be considerably darker than in health, or quite colorless, and he still keep well. But when any change has persisted for a considerable period, trouble may with good reason be suspected. The quantity being scanty for several weeks, unless it be during warm weather, there is a possibility of kidney disease. Blood but rarely appears in the urine except after accidents, which must be serious indeed to produce such a change.

Constipation during fevers may be due to dryness of the intestinal matters, the water in the same having been drawn out and disposed of by the heat. But even in fevers, diarrhoea is more common than constipation after the first days. The latter is quite constant where digestion is sluggish and poor, the diet consists almost wholly of meat, and not sufficient exercise is allowed; the discharges are then usually dry, hard, and round. In peritonitis, or so-called inflammation of the bowels, slight diarrhoea usually first occurs, but constipation soon sets in. The appearance of the evacuations is sometimes instructive. Thus, when about the color of clay, there is trouble in or about the liver, and generally the passage of the bile into the intestine is stopped for the time being. When bile is poured into that canal in unusual quantities, the evacuations are very dark, and greenish or blackish. Diarrhoea may be due to gastric or intestinal irritations or inflammations, or it may result from exposure and chilling the surface, improper food, poisons from the outside or others formed within the system, hard work immediately after a hearty meal, or from many other influences. Blood is occasionally evacuated, and then, if bright red and accompanied by much straining, the chances are many that a sharp piece of bone is making its way out. Very offensive evacuations sug-

gest disorder of the liver, digestive disturbance, or quite severe intestinal irritation or inflammation.

Thus it would appear that by noting the appearance of the intestinal discharges, oftentimes information of much diagnostic importance may be acquired.

A dog may occasionally emit a whine or cry to evince a pleasurable feeling, and if so its nature will be duly appreciated, and the difference between such expressions and any other be promptly recognized. As a rule, dogs seldom cry except when in trouble, and then the character of the sound will generally indicate whether or not that trouble is serious. A short and high-pitched cry is heard in diseases of the head, also oftentimes when a convulsion is coming on; and to those who hear it for the first time it is suggestive of a crazed and disordered brain. A hoarse, croupy, blended howl and wail is peculiar to rabies; while in attacks of sharp and severe pain the cry is one that must at once excite a suspicion of the real and true cause.

A dog may act wildly and be really "out of his head," and the trouble be only transitory, as when caused by intense heat or after a convulsion; but such condition should be treated as a serious matter, and the sufferer so placed that it will not be possible for him to do any harm.

If a dog responds very slowly when called, he should be at once allowed to return to his kennel, and after a time visited there, and his movements watched carefully. His delay in responding may be due to physical disability or to dullness. If it is seemingly difficult for him to get up, the trouble may be the consequence of an injury, general weakness, inflammation of the joints, paralysis, etc., the precise nature of which, of course, must be determined; while if any of his senses are less acute than normal, the fact ought to be easily made clear by a few simple tests.

The general appearance of the body is indicative of the state of nutrition. In nearly all long-persisting diseases fat is lost and emaciation results. In affections of the digestive organs the reduction in weight is slow, while in diabetes it is rapid. An increase in size in certain parts of the body, attended with general emaciation, is an ominous sign of grave, defective nutrition.

In the foregoing some of the most common symptoms appearing in disease, with their usual significance, have been briefly mentioned. Compared to the possible manifestations, however, they represent but a small proportion. A disease is but rarely, if ever, twice ushered in with identically the same symptoms, nor does it run its course with unvarying phenomena. This fact must be accepted by the reader, who might, without a knowledge of it, anticipate finding in each case all the signs typical of the existing affection.

Of this somewhat rambling discussion the purpose has been to familiarize the reader with the essential manner of proceeding from one point to another, to reach what is called a diagnosis of a case; which will often be difficult, but only rarely impossible to a close and intelligent observer.

CHAPTER II.

NATURE OF DISEASES.

THE disorders which may occur in either sex and at any period of life consist of disturbances of the action of some organ or organs by morbid causes, or alterations of the structure or substance of one or more organs, which also induce changes in the action of the same. The first of these are termed "functional disorders," the others are "organic diseases." So intimate is the relation existing between all of its parts, that only mild and very limited affections can occur without the whole system becoming involved and sharing in the disturbance. On the other hand, when a disorder first affects the blood, and is therefore of general character, nearly if not quite always one or more important organs are very soon deranged. In the first instance, in which the trouble begins in particular organs and chiefly affects them, the cases belong to the so-called local disorders or diseases; whereas those that start in the blood and involve the body in its many functions are termed general diseases.

Among the terms in use and applied to various affections of organs of the body are irritation, congestion, inflammation, mortification, degeneration, atrophy, hypertrophy, and morbid growths. In the action of a mustard-plaster, the conditions covered by several of these terms appear. Very soon after it has been applied, the skin is stimulated and the circulation quickened in the parts immediately beneath the plaster. Thus far the action may be said to be a healthy one. If, however, the mustard be allowed to remain on a short time longer, and until it has caused pain and soreness, then the condition exists which well illustrates irritation. Now have it remain on still a while longer, and it will produce inflammation.

The terms congestion and hyperæmia are synonymous, the latter being more in use among physicians. It means, literally, an excessive amount of blood in certain vessels, especially the smallest, called the capillaries. Hyperæmia, or congestion, exists when more blood than usual is flowing through a part, — it is then termed active hyperæmia, — or when there is a collection of more than the normal amount of blood in a part, the same being as it were stagnant and not circulating actively, which condition is known as passive hyperæmia. In contradistinction with this there is the term local anæmia, which is a deficiency of blood in the part to which the term is applied.

When a part becomes red, swollen, and painful, and there is unusual heat in

the same, it is inflamed. As the evidences of inflammation disappear, what is termed resolution is taking place. After that process, in some instances no notable change in the affected part remains; but often when there is inflammation a so-called effusion of lymph occurs, which, if not soon absorbed, glues together the movable tissues involved, and thus the parts are left more or less stiffened. In some inflammations, also, as of the covering of the lung known as the pleura, there is an effusion of serum, which is a thin fluid constituent of the blood that separates from the clot in coagulation.

Suppuration is the formation of what is commonly called "matter," but properly termed pus. This is seldom absorbed, and only when the quantity is small. If left to itself it is quite sure to force its way out, and in doing so it takes the course in which it meets with the least obstruction. Using a finger as an illustration, pus forming in that finds an opening on the surface very difficult because of the thickness and toughness of the skin, therefore it burrows backward into the palm of the hand, where it will be easier to effect an opening.

Pyæmia, sometimes termed purulent fever, is a traumatic, infectious disease, characterized by the poisoning of the blood by pus, a tendency towards the formation of abscesses or collections of pus in different organs, fever and very great prostration. Septicæmia, or septic wound fever, is a general disorder of the system caused by the poisoning of it by putrid or decaying matters absorbed from an unhealthy wound.

Mortification, also called gangrene, is the actual death of a part. It does not often follow inflammation unless the same is of exceeding intensity, or the subject is very greatly debilitated; and where it occurs it is generally after the affected part has been literally and directly killed by cold. In gunshot wounds there is also a special liability of the occurrence of mortification. The term chronic inflammation is often used when redness, heat, pain, and some swelling have been of long standing; but there is reason for the belief that in many cases so designated, instead of the affected parts being inflamed, they are merely in an irritable condition.

When an organ or part becomes enlarged from overgrowth only, in the absence of any essential change in its nature, it is said to be hypertrophied. In disease of the heart, for example, where one of its valves is imperfect and that organ must labor harder than it otherwise would be obliged to do to keep the blood circulating as it ought, it grows thicker and more powerful, or, in other words, it becomes hypertrophied. This increase in size continues up to a certain point and then stops; and thereafter, although the heart really grows larger, it is not because its walls have thickened and become more powerful, as in the first instance. There has occurred an essential change in the nature of the organ, and the enlargement is due to dilatation,—to a stretching and thinning of the walls. Atrophy is the reverse of hypertrophy. Under certain conditions organs and parts shrink in size, and even the entire body may experience like

change or atrophy, as in old age. Want of blood, of nervous energy, or of use, are the common causes. Degeneration may be said to have occurred in an organ or a part of the body when there has been a change in its substance. Thus fat, by taking the place of the muscular tissue, may cause the heart to degenerate. Or the arteries may become degenerated in consequence of the intrusion of a bone-like material and the displacement by it of their proper substance. In degeneration also there may be a hardening or softening of the parts affected.

Morbid growths include warts, wens, bony enlargements, tumors, etc. The use of the term is generally restricted to growths which do not endanger life, and which are also called innocent; while others, like cancers, are designated malignant.

CAUSES OF DISEASE

A knowledge of the causes of disease is not only necessary as a basis of prevention, but in many instances it is of much importance in effecting recovery. If the disease-producing agencies are known, their disturbing influences can, in a great measure, be obviated. After giving rise to disease the cause frequently continues active, and before a cure can be effected its removal is imperative. The essential causes and precise nature of many morbid conditions have been discovered, but progress in that direction is slow, and the field yet to be covered by investigators is wide. A growing understanding and an accumulation of facts and individual experiences, are materials from which, at some future period, will be developed truer perception and a more accurate knowledge of the causal connections of disease, and their conformity with fixed laws.

As generally defined, causes are internal or external. The former are developed within the animal economy, and are the results of impairments of certain vital processes. For instance, when the kidneys act imperfectly, urea, a poisonous constituent of the urine, is retained in the blood and disease excited. Among the external causes are infectious and contagious matters, the different poisons, also wounds, injuries, and all harmful influences which exist independent of the animal organism yet are active agencies in inducing disease.

Causes have also been distinguished as ordinary, and special or specific. Ordinary causes are those to which all dogs are more or less exposed, each giving rise to certain forms of disease. They may also be termed unavoidable, and include heredity, age, and sex. Special or specific causes are those which are only now and then encountered; and each cause gives rise invariably to but one form of disease. There is no satisfactory evidence that any of these causes ever arise spontaneously; in every case the pre-existence of the specific poison or organism is necessary. Tetanus and, beyond doubt, distemper, illustrate the diseases which

are produced by special or specific causes. In fact, that the cause is specific is to be inferred if the disease it gives rise to can be transmitted from one dog to another, or, in other words, is "catching," and the special germ or poison develops that same malady always, and no other.

Infectious diseases are known, or at least confidently believed, to originate through the infection of the system with certain peculiar poisonous matters, and the same are mainly distinguished from ordinary poisons by their ability to reproduce themselves, under favorable conditions, to an unlimited extent. The peculiarity of this class of diseases is their specificness, which is evident in the fact that a given kind of disease is solely due to a given kind of morbid agent or cause. In this respect they are essentially different from diseases propagated by ordinary causes. Of the latter class exposure to cold is an illustration, and that may occasion different affections in different subjects. Thus, in one dog it may give rise to bronchitis, and in another to colic or diarrhoea. On the other hand, infection from a dog suffering from distemper primarily produces that disease, and never any other.

Strictly defined, contagion is the conveyance of disease by touch or contact. But some disorders, not all, however, which may be transmitted by actual touch, are yet capable of passing a short distance through the air and doing their evil work. Infectious diseases are communicable and contagious. They are not all alike propagated by immediate, direct, or personal contact. In some such diseases the contagious element is fixed close to the body affected, or is attached to objects once in contact with the body. In some others the poison which causes them is more volatile; it is dissipated from the body, and disseminated to a greater distance through the air. In still others it is the discharges from the intestines which chiefly convey the contagion, to finally infect the soil, and through that or sewage canals, by filtration, to great distances, the drinking-water. To breathe infected air or drink infected water, though distant from the focus of infection, suffices to engender some maladies. The contagion of others, of which diphtheria is an example, must be lodged upon the mucous membrane; while that of rabies, the virus of venomous animals, and of a few other maladies, to produce infection must be inoculated into the very blood itself.

Certain infectious diseases are termed miasmatic. Miasm, in its original and broadest sense, is the name of any material contained in the air that can produce disease. The term is now used in a far narrower sense, and in contradistinction with the term contagion. The latter being accepted to be a specific excitant of disease which originates in the organism suffering from the specific disease, miasm is used to designate a specific excitant of disease which propagates itself outside of and entirely separable from a previously diseased organism. Contagion can be conveyed by contact from a diseased dog to a sound one, produce the disease in him, and then reproduce itself. Miasm originates

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from without; taken up into the body, it can call a specific disease into action, but it cannot spread that malady any farther by conveying it from a diseased to a sound dog.

Disease-producing poisons are termed volatile and fixed.

The so-called germ theory of disease now explains the causation of some of the infectious diseases, and without doubt additions to the number will be constant, although necessarily slow. To discuss that theory comprehensively herein would not be possible, far too much space being required; it will therefore be touched on only very lightly.

The organisms which produce disease are called bacteria. This name, which properly belongs to a peculiar species and has been generalized, covers the smallest and at the same time simplest and lowest, of all living forms. They either constitute the boundary line of life or are indeed very near it. Notwithstanding the colossal amplification of microscopes of the present, the smallest bacteria do not appear larger than the points and commas of good print; and the smallest has not inaptly been compared with man about as a grain of sand to Mont Blanc. The part played by bacteria in nature is an important one. They exist everywhere, and have their use in the general economy. They are nourished at the expense of organic substances when in a state of putrefaction, and reduce the complex constituents of the same into those which are simpler, — into the soluble mineral substances which return to the soil from which the plants are derived, and thus serve afresh for the nourishment of similar plants. In this way they clear the surface of the earth from dead bodies and filth, from all the dead and useless substances which are the refuse of life, and so unite animals and plants in an endless chain. But besides these useful bacteria or microbes there are others which are injurious to mankind and the lower orders of animals, while they fulfil the physiological destiny marked out for them by nature. Such are the microbes which produce most of the changes in food and industrial substances, and a large number of the diseases to which man and domestic animals are subject. The germs of these diseases, which are only the spores or seeds of the microbes, float in the air breathed and in the drinking-water, and thus penetrate to the interior of bodies.

Certain causes of disease are distinguished as traumatic, and the affections produced by them are termed traumatic diseases. Anything which occasions an injury or wound of a part, and consequently disease of that part, is a traumatic cause.

Puppies are seldom born with transmitted diseases, but where either of the parents is the victim of disease or constitutional infirmities, the offspring very generally exhibit strong tendencies to those same or other defects; and such generally appear in them about the time of life that their parents first suffered, unless their coming is hastened by improper feeding or other faults in management.

Causes are said to be predisposing and exciting. While the former are influential in increasing the susceptibility to disease, the kind of disease and its occurrence are determined only by the latter causes. The term vulnerability is used in contradistinction to predisposition. While the latter denotes a tendency to a particular form of disease, the former is expressive of a general susceptibility to all disease-producing influences.

The causative influence of age is very considerable. Thus, during early puppyhood the stomach is comparatively delicate, and the power of the system to resist disease and disease-producing agencies, as exposure, etc., is very low. Previous to maturity, inflammatory disorders, with but few exceptions, are most liable to occur. The old exhibit increasing debility and infirmity. The common tendency is to grow fat and unwieldy. There is then an especial liability to fatty degenerations of certain vital organs, and to chronic catarrhal affections.

DIAGNOSIS AND PROGNOSIS.

The term diagnosis means the discrimination of diseases; that is, determining their character and situation. It is obvious that treatment cannot be successfully employed until their nature and location have been made out, or in other words, a diagnosis has been reached.

A symptom is diagnostic when it occurs more frequently in connection with a particular disease than with other diseases. Symptoms are of variable significance. There are a few which are inseparable from a disease, — being found in that and no other, — and these are distinguished as pathognomonic. As an illustration, a rusty-colored, semi-transparent, and adhesive matter is expelled from the air-passages in pneumonia only; and this, therefore, invariably denotes the existence of that disease. Some symptoms are said to be highly diagnostic; for while not conclusive evidence of particular diseases, they occur in them so often that when noted the chances are many that those diseases are present.

Unfortunately only a very small number of diseases exhibit pathognomonic symptoms. Another important fact to be remembered is that all the symptoms typical of a disease are but rarely present in a single attack. Some that are common to certain diseases may be absent altogether; others that are not considered important are now and then very prominent; and in no small number of cases there appear foreign symptoms, that is, symptoms that are not usually manifested by, nor indicative of, the existing diseases. All of which, of course, tend to mystify and embarrass the investigator, and render diagnoses more difficult. Each case therefore must be carefully studied; and a decision should not be based on a few individual symptoms merely, but all observed should be duly weighed, and conclusions drawn from them as a whole.

In attempting to reach a diagnosis it is generally necessary to have the previous history. Obviously a knowledge of the duration of the symptoms will materially assist in determining whether an existing affection is of acute or chronic character. Were a dog recently to all appearances in good health, and the attack more or less sudden in its invasion, the disease from which he is suffering is probably of acute character; whereas, if for a long time he has been exhibiting signs of ailing, and the disturbing symptoms are much the same as those he has had, only more severe, then nearly all the chances are that his affection is chronic and of long standing.

The reader will doubtless meet cases in which it will not be possible for him to make a correct diagnosis. Nor is it reasonable to suppose that in any one work on the subjects to which this is devoted, notwithstanding the same be an exhaustive treatise, can be embodied all the principles of medicine and teachings necessary to make a skilled diagnostician of a layman. Even physicians of the highest practical endowments often err in their attempts to discriminate between diseases; and that diagnosis involves more embarrassment than the treatment of disease should be appreciated by all.

A highly effective method of making a diagnosis is called "reasoning by way of exclusion." In a case of doubt the disturbing problem is generally to decide between a small number of diseases. From the symptoms noted it is evident that the disease to be dealt with is one of two, three, or more, all of which have some resemblance. Now, if it be impossible to determine positively which of those diseases is present, it may be practicable to decide that one, two, or more of them cannot be the right disease, because certain symptoms are absent. By such process of elimination the number of possible diseases may be reduced even to one. The application of this method may be illustrated as follows:—

A dog does not respond to the usual call, and is sought for in his kennel. He is found unable to leave it, and to present these symptoms: His breathing is rapid and labored; his manner exceedingly dull; he opens his eyes only to close them at once; hangs his head, and it falls as though he slept, but he raises it from time to time as he seems to waken or is disturbed by a dry, hacking cough, or possibly "gagging," a result of which now and then is the expulsion of a little rust-colored sputa. His nose and body are very hot. He lies down, but soon assumes a sitting position, with fore legs quite widely apart and braced.

The trouble may possibly be in the throat, but it is evidently in the chest. As he has been well up to the present time, and the attack was sudden, his disease must be acute, therefore all chronic affections may be at once excluded. Manifestly, also, his trouble must be either laryngitis, bronchitis, asthma, pleurisy, or pneumonia.

An examination of the throat dispels the doubt respecting laryngitis. No knowledge of a previous attack, and in the absence of wheezing respiration and husky, barking cough, asthma is reasonably excluded. In bronchitis, so early in

the disease, such marked constitutional symptoms could not be expected, and while some fever would probably be observed, it would scarcely run so high ; again, while the breathing is often accelerated, it lacks, in the early stages at least, that labored character. Pain in bronchitis is evident when the patient coughs, and is less apparent in the interval. His discomfort would tend to make him restless, and on lying down he would assume no unusual position. These facts considered render bronchitis improbable. Uneasiness of the animal is one of the marked symptoms of pleurisy. That indication is absent in this patient. The breathing, too, is different. While in pleurisy it is labored, it is also unmistakably painful, and inspiration is shortened in consequence. A dog affected with that disease would seem to avoid taking more air into his lungs than absolutely possible. There would be a restraint in the working of the muscles of the chest that plainly told of pain. This, too, would be shown in the cough, dry and shortened, with little or nothing raised. While fever is present in pleurisy, it is seldom notable in the early stage, or runs as high as observed in this case. If these differences in symptoms noted are insufficient, an examination of the chest by the ear will remove what doubts remain.

Pleurisy finally excluded, the only disease remaining is pneumonia, and that is the correct diagnosis.

Prognosis is prediction of the course and final result of a disease as indicated by its symptoms. This is an important division of medicine, for obviously a correct estimate of the course that a disease will take must be measurably influential on its treatment.

In making a prognosis the symptoms are not alone to be relied on ; there are other circumstances and conditions which it is necessary to consider in its connection. Some dogs are less able to safely bear up under and overcome disease than others ; and recovery might take place in one instance, while in another a disease of the same intensity and severity might prove fatal. The circumstances connected with diseases upon which a prognosis is based are termed prognostic. In predicting the course of a disease, all the symptoms present should be carefully weighed, as often one, which alone would be insignificant, becomes, in its relation with others, of grave importance. A clear understanding of the complications which might arise in the course of a disease is also important in reaching a prognosis.

It must be plainly evident that in a kennel which is habitually badly managed, the chances of a very sick dog making a good fight against any severe malady would be less than when such grave fault did not exist. The weather is an important factor, especially in acute diseases which involve the air-passages. The reparative powers of old dogs are comparatively low ; hence age must often be influential. The effects of previous impairment of health must also be unfavorable in many attacks. Pneumonia occurring as a complication of distemper is but rarely recovered from. Great irritability, wildness, delirium, or other

brain symptoms, are very generally of grave significance, and a fatal result may be anticipated in most cases if such symptoms persist even for a few hours. Notable emaciation is not so very important in acute diseases, but in all chronic affections the outlook is always very serious indeed. Emaciation alone, also when the cause cannot be determined, is a very discouraging symptom. When convulsions have lasted for half an hour, or recurred after an interval of freedom from them produced by chloral, ether, or chloroform, they may be regarded as almost certain to prove fatal. A rapid, flickering, and feeble pulse is a very unfavorable sign. When the temperature of the body falls three or four degrees below the normal, and remains down, speedy death may be apprehended; a rise of more than five degrees above the normal is also of grave significance unless a fall soon occurs. Death approaches through one of the three vital organs, the heart, lungs, or brain; the first to falter in its action governs the train of symptoms which follows. Among the signs of a dying state are coldness of the feet and legs, a sudden pinching of the expression, sinking and fixedness of the eyes, blueness of the lips and tongue, cold and clammy perspiration, dropping of the jaw, muscular twitchings, stupor, and a jerking inspiration, if not dependent upon diseases of the lungs. Death itself, as vital force departs, is not painful, even though intense suffering may have preceded it.

PART THIRD.

THE PRACTICE OF MEDICINE.

SECTION I.

DISEASES OF THE RESPIRATORY SYSTEM.

CHAPTER I.

INTRODUCTORY.

IN treating of each disease there will be duly considered the symptoms, known or probable causes, intrinsic tendencies as regards termination in recovery or death, and the complications which are likely to occur, together with their probable consequences.

The consideration of treatment will embrace not only the indications for the use of medicines, but of hygienic measures, which are of scarcely less importance. The means of prevention and of removing or obviating the causes of disease, being intimately connected with the study of treatment, will claim due attention.

Before entering upon the consideration of individual diseases it is advisable to briefly touch at a few points of distinction which are of practical importance.

Some diseases run a definite course, are but slightly affected by treatment, and naturally tend to end after a certain time. These are distinguished as *self-limited*.

The term *expectant* will be occasionally used. The treatment of disease by expectation consists in watching carefully its progress and meeting, with appropriate measures, unfavorable symptoms as they appear; in fact, in withholding active treatment until the need of it is plainly evident.

The so-called *abortive* measures are those employed to arrest the progress of a disease or cut it short in the first stage. *Palliative* measures are employed to relieve pain or suffering. *Sustaining* or *supportive* measures consist of tonics, stimulants, and food, and are especially required in acute attacks of great intensity, which threaten life by prostration of the vital forces.

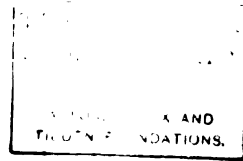
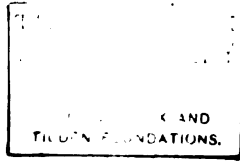
In prescribing drugs simplicity will be observed, and when possible, concen-



INFLAMMATION OF THE LUNGS.



ACUTE RHEUMATISM.



trated remedies be advised, since they are generally more easily borne on the stomach and less difficult to administer.

To withhold medicine is quite as important in some cases as its free use in others. The indications in disease should be carefully studied, and active treatment instituted only when the need is manifested. The efficacy of other measures aside from the employment of drugs should be appreciated, and every known influence, dietetic, hygienic, or other, be called to assist in the cure of the sick.

ACUTE CORYZA.

It is popularly supposed that the term catarrh is applicable merely to a chronic irritation of the lining membrane of the nasal passages; whereas rightly it means an affection of any mucous membrane, whether of the nostrils, bronchial tubes, or elsewhere, in which acute inflammation is followed by a flow of mucus, or phlegm, as it is commonly called. But acute catarrhs of all important membranes are considered herein as distinct diseases, — for instance, bronchitis, or bronchial catarrh, enteritis, or intestinal catarrh, etc., — consequently the term here might be restricted to an affection of the nasal passages, yet it is objectionable and likely to invite confusion; hence it is advisable to substitute for it coryza, a term in use by physicians, and the meaning of which is well understood by laymen.

Coryza, then, is an acute inflammation of the mucous membrane lining the nasal cavities, or, popularly speaking, simply “a cold in the head.”

The changes which characterize it are identical with those which occur in man. That is, there is first dryness and swelling of the nasal mucous membrane, in consequence of which the nostrils are more or less obstructed. The lining of the tear-passages and the membrane covering the eyes also share in this inflammation. In the course of two or three days the affected membranes seem to recover themselves somewhat, and endeavor to effect a cure by washing away the trouble, as it were; for they pour out their natural secretion, mucus, in abundance. There is then no longer any dryness, nor nearly as much heat, while the swelling also begins to subside. This flow of mucus persists, but lessens steadily until the affected membrane is back to its former healthy condition.

In the majority of cases coryza is due to “catching cold” by too sudden cooling of the body after being over-heated or lying in a draught. Very rarely it is caused by the pentastoma tænioides, a small parasite which has some resemblance to the tapeworm. This locates itself in the upper nasal passages and cavities of the forehead, but sometimes appears in the throat.

Coryza is one of the most constant symptoms of distemper. It may also

result from the inhalation of irritants, as dust, smoke, fumes from chemicals, etc. ; and occurring as it does in epidemics, and being often contagious and conveyed from one to another, it is certainly reasonable to infer that it is at times of microbic origin.

In ordinary cases the earliest symptoms of the affection are watery discharges from the nose, with evident obstruction to breathing through it, sneezing, and redness of the eyes, which are also watery. Dogs presenting these signs wipe their nose with their paws, and are usually somewhat languid, and not inclined to eat nearly as much as usual. They may also have slight fever, but the temperature is seldom more than one or two degrees above the normal in this affection alone. Nor is there considerable quickening of the pulse. Finally, there occurs the more or less abundant muco-purulent discharge, and recovery has commenced.

When produced by the tænia-like parasite the symptoms are somewhat modified. In simple coryza due to other causes there is but rarely indeed any bleeding at the nose ; but when the parasite is present, the nasal discharge is more or less bloody. It contains more purulent matter, and has a very offensive odor. The general system also is more disturbed in such cases ; and it is even possible for the inflammation caused by the parasite to extend and involve the coverings of the brain, and so terminate fatally. The symptoms then are those of acute meningitis ; or there may appear a tendency to snap and bite, as in rabies. To add to the resemblance of the symptoms of that malady, paralysis of the lower jaw may occur, as in the dumb form.

The natural tendency of the ordinary inflammation in the nose is to extend down the throat and into the bronchial tubes. On reaching the former it is pharyngitis and laryngitis, and in the latter bronchitis ; all of which will be duly discussed elsewhere.

Coryza alone and uncomplicated is not a common disease in mature dogs, for it usually merges into bronchitis ; but very young puppies are quite frequently victims of it, and with them it almost always runs its course and ends as such, — that is, the inflammation is confined throughout to the nose.

Frequently occurring attacks of acute coryza might produce the chronic form, commonly termed chronic nasal catarrh, that is also sometimes found in old dogs whose lungs are unsound, and consequently their systems are steadily breaking down. Other cases justify the belief that this chronic trouble is sometimes caused by a peculiar germ.

In ordinary attacks of coryza, to give a purge as soon as the first symptoms appear, feed lightly for a week, and keep the patient in comfortable quarters, is the treatment advisable for older puppies and mature dogs ; and it will generally suffice. If, however, the attacks are very intense, and the victims seem quite ill, the following might be obtained : Sulphate of quinine, three grains ; fluid extract of belladonna, two minims ; salicylate of sodium, thirty grains ; camphor, three grains. When the patient is of medium or largest-size breed this mixture

should be made into ten tablets or pills, one of which may be given every hour. If, however, he is of smaller size, the number of tablets or pills should be increased to twenty, and one be given every hour.

In pups only two or three weeks old the nasal trouble interferes with the nursing and prevents sleep, yet but little can be safely done for them. Some relief may be afforded by lubricating their nostrils with vaselin, fresh lard, or the like. If danger seems to be threatened, a soothing inhalation should be tried as follows: Place the pups on a chair having a cane seat, and raise over it an umbrella, allowing the same to fall as low as possible. Into a pint of boiling water put two teaspoonfuls of the compound tincture of benzoin. Let this be in a shallow pan under the chair. In order to generate a vapor, heat stones about half the size of the fist, and put one into the pan. Follow this with others as often as necessary, for fifteen or twenty minutes.

In cases caused by the parasite described, and the patient an old pup or mature dog, it is advisable to first open well the nasal passages by means of a five per cent solution of cocaine. A little of this can be thrown in by a spray-producer, or introduced on a small bit of cotton securely fastened to the end of a large strong straw taken from a broom. Then the passages should be syringed with the peroxide of hydrogen diluted with three parts of water. Thus the parasite should be at once destroyed. It sometimes, however, as stated, penetrates to the cavities of the forehead, where it is possible to reach it only after the operation of trephining has been performed.

LARYNGITIS.

The larynx is the vocal part of the windpipe, located in the throat at the base of the tongue, and an inflammation of the mucous membrane which lines it is termed laryngitis. In general character it closely resembles the same affection in man, and may run a course so mild that it be insignificant; or the inflammation may be intense and excite other changes, which render it very serious, and even a menace to life. It may also be acute or chronic; but the latter is very uncommon, consequently the former only deserves to be considered at any length.

Acute laryngitis may be caused by exposure to sudden and great changes in temperature, and this is the rule in man; but in dogs the common causes are mechanical injuries, as from slivers of bone lodged in the throat, irritant inhalations, or prolonged barking. Indeed, it is very often induced by the latter during dog shows. External injuries to the neck may also excite it, as tugging at the chain; and pugs and other small pet dogs which their owners exercise under restraint are frequent victims. In these instances, fortunately, the affection is usually of short duration. Of the various irritants, smoke is the most active one likely to

be inhaled. Ammoniac gases arising from refuse under stables may, however, render the larynx very irritable, in which condition acute inflammation is easily excited by exposure to cold and wet. Again, this affection may be but an extension of a similar inflammation in the nasal passages, i.e., coryza. Finally, it is almost always present in severe attacks of distemper.

Hoarseness in barking is the most prominent symptom. A hoarse, brassy cough may also generally be excited by outward pressure over the upper part of the windpipe when the larynx is inflamed. There is often present some impediment in swallowing, and perhaps in respiration. As a rule, but little, if any, fever is appreciable, and the pulse is scarcely quickened. Yet now and then are encountered cases in which all these symptoms are severe and threatening; and in them the inflammation, instead of being superficial, is quite deep, and there is an effusion of serum—the fluid portion of the blood—beneath the mucous membrane of certain portions of the larynx. The trouble is then what physicians call œdema of the glottis. This seriously interferes with respiration, and may even produce suffocation if not promptly relieved. The breathing is very harsh and noisy, rapid and jerking; in fact, it is identical with that observed in children suffering with true croup. As in this, one of the gravest maladies of childhood, there are at times spasms in the larynx which nearly close the windpipe, and cause distress that is terrible to witness.

When laryngitis occurs with coryza the symptoms of the latter are of course present, and do not differ from the ordinary, excepting that the discharge from the nose is bubbling or frothy if there is much impediment to swallowing.

Chronic laryngitis is seldom persistent; that is, the inflammation is rarely continuously of sufficient intensity to give rise to appreciable signs. As a rule, it is scarcely more than an irritation. In other words, the lining of the larynx is irritable, and easily inflamed by barking, exposure to cold, and other influences which are capable of exciting the acute form. But when it follows distemper, and the voice does not return as the general health is restored, it generally proves obstinate; and in some instances a cure is never effected, because the trouble is complicated with partial paralysis of the vocal cords.

Only very few deaths result from laryngitis alone, and never from the chronic merely; while in the acute form recovery is almost certain to take place unless the throat has been badly lacerated, as by a bone, or the trouble caused by inhalations of a powerful irritant. As previously stated, smoke is the irritant most likely to reach dogs; and let one be caught in a burning building where it is dense, if not soon rescued, even if not otherwise injured by the fire, the outlook is that he will die within thirty-six hours unless he is very skilfully treated.

Mild cases of acute laryngitis do not require any active treatment. Confined in a room well ventilated and heated uniformly, and fed lightly for a few days, recovery will usually take place speedily.

In cases which threaten to be severe, a purge should be promptly given.

The neck may also wisely be bandaged with a flannel wet with kerosene oil, over which there should be placed another, but dry, flannel. Or if the respiration is much impeded, it will be advisable to attempt to relieve the congestion or spasm within by the means of a large sponge wrung out in hot water. This should be applied to the front of the neck, lightly bound with a napkin, and changed every few minutes.

Internal medication is not easy, owing to the resistance offered, and should therefore be attempted only where it seems urgently demanded. Of the various agents which act well in this affection, the oil of copaiba is one of the very best; and it can be given in doses of fifteen drops as often as every third hour if the attack is severe. It should be emulsified as follows: Add a teaspoonful of it to a raw egg, beat well with a fork, and give one-fourth of the entire quantity at each dose.

Where suffocation is threatened, inhalations of steam may relax the affected parts and so open the larynx a little; and in order to apply them, the dog should be put into a small room in which there is a common washing-tub holding water to the depth of one or two inches. In this a hot flatiron or brick should be dropped every few minutes.

When suffocation is imminent and all other means have proved futile, the operation known as tracheotomy is the only chance remaining. In this the operator cuts through the neck into the windpipe and below the swollen larynx. But it is truly a forlorn hope; moreover, there are but few men outside of the surgical profession who can rightly undertake it; and should it become necessary, the best surgeon within reach should be obtained. The owner will do well to tell him, if he has never performed the operation on a dog, that he must make his way very carefully; and at best he is likely to have troublesome hemorrhage.

It is important to remember that a symptom which is considered highly characteristic of rabies, and one that usually appears early in the disease, is the peculiar alteration in the tone of the voice. The bark is described as a sound between a bark and a howl, uttered in a rough, hoarse tone, which might be called croupy, and is attributed by some to a swollen condition of the pharynx and larynx.

Chronic laryngitis scarcely requires other than hygienic treatment.

BRONCHITIS.

An inflammation of the lining membrane of the bronchial tubes constitutes bronchitis. It may be acute or chronic. Both forms can properly be considered together, for reasons that will appear anon. The acute is rightly designated a

"severe cold on the chest." It may originate in the bronchial tubes themselves, but with rare exceptions it follows and is a direct extension of a catarrhal inflammation in the nose and throat. The membrane involved is swollen and reddened; its natural secretion is lessened or entirely absent for a time, and then becomes much more abundant than in health, also yellowish, from the presence of pus. This has led to a division of the disease into two stages, the dry and the moist, which are defined by these changes. The first usually lasts about two days, and the second and final stage until recovery has occurred.

This disease may be primary or secondary; that is, an attack may be acute bronchitis from the first, and developed in the usual way, or, as stated, it may be associated with other affections of the air-passages. It is also of frequent occurrence in distemper. Chronic bronchitis may likewise occur alone or as a complication of other chronic diseases of the lungs, as tuberculosis. Again, bronchitis may be sub-acute, or, in other words, merely of mild intensity and short duration.

It is generally accepted that acute bronchitis is usually the direct manifestation of chilling of the surface of the body or breathing cold air while overheated. Of course pampered pets that hug, as it were, kitchen stoves, or are permitted to constantly lie near registers, when they go into very cold air are in a condition specially favorable for the occurrence of acute bronchitis; but in dogs differently placed it is not likely that exposure to cold is the cause in any considerable proportion of attacks. Indeed, many must be attributed to some special atmospheric influence not understood, and probably bacterial; for not infrequently the disease prevails as an epidemic. Moreover, where dogs have been quartered together, oftentimes several have been attacked in turn.

Unless much heated or fatigued by a hard run, a healthy dog is not liable to yield to and be made ill by exposure to cold or other hardships of the weather, and bronchitis rarely attacks him. On the other hand, the dog that has a delicate constitution, which is either natural or has been acquired under debilitating influences, as those existing in ill-ventilated, damp, and unclean kennels, is comparatively an easy victim. Another fact which deserves emphasis is that the liability to contract this and other acute pulmonary affections is influenced greatly by the feeding and amount of exercise taken. For instance, feed generously and keep a dog much confined, and he will be especially liable to take cold on exposure; whereas he that is fed rightly and has constant liberty is practically safe from such danger. The explanation is easy. Where there is insufficient exercise, and especially if the quantity of food is in excess of nature's requirements, the system is choked with waste material which should have been eliminated. More or less of this waste, which is poisonous, is in the blood, and the workings of all vital organs are in considerable degree affected by it. They are then more liable to become inflamed; and this is especially true of the lungs.

Inhalations of irritating gases are capable of causing this disease; but dogs are rarely exposed to such,—that is, to gases sufficiently potent, unless it be

smoke, which must be thick, or the exposure quite protracted, to have the harmful effect.

As said, bronchitis generally follows a similar inflammation in the nose and throat, therefore, as a rule, there is first acute coryza. But the inflammation extends downward so rapidly that the throat is seldom more than lightly touched by it, consequently the trouble there is scarcely noticeable. Usually the coryza has existed for about two days when the cough is first heard, and then it is short, dry, and dull; but ere long it is easier and "looser."

An inflammation in the chest must necessarily be attended with greater general disturbance than a similar trouble confined merely to the nasal passage, therefore, in bronchitis the disinclination to active movements is more marked. The victim is somewhat depressed and spiritless; he has but little if any appetite. Pressure on his chest causes him to cough. He likely shivers at times, and has some fever, which is higher, while the pulse is more rapid, than in simple coryza. It is a significant fact, however, that the rise in temperature and pulse-rate is never considerable in bronchitis. With this in mind there should not be much danger of confounding it with that serious disease pneumonia.

In simple acute bronchitis the respiration is not quickened, but it may be wheezing. There is, however, a form in which the breathing is very rapid indeed, namely, the so-called capillary bronchitis, in which the disease invades the very small bronchial tubes. But fortunately this, a fatal malady, is very rare in dogs.

Ordinary bronchitis, when occurring independently of other affections, may be considered trifling, as it does not endanger life, nor is it likely to become chronic; and as a rule, recovery takes place in the course of one or two weeks.

As for chronic bronchitis, a cough persistent for a month or more may be considered evidence of that affection if the victim seems otherwise healthy. But it is seldom noted in dogs, even among those well advanced in life, who are the most inclined to it; and generally, is not of any importance.

There is yet another form of bronchitis which deserves passing mention, although but few cases of it have been recorded, namely, "verminous bronchitis," which, as its name implies, is caused by worms, reputed, in the best authenticated cases, to be of the genus *strongylus*.

Simple acute bronchitis rarely requires medicinal treatment; for naturally its tendencies are all towards recovery, and, as a rule, the patient will do quite well, if not much better, when not interfered with. But of course to guard him against taking more cold is always necessary, and a comfortably warm and well-ventilated room indicated. This afforded, and the diet kept low for a few days, about all required will have been done.

The cough is salutary, for it keeps the bronchial tubes free; and when the affected membrane is right, this symptom will disappear voluntarily. If, how-

ever, it were very severe or persistent, it would be expedient to give one table-spoonful of cod-liver oil three times daily, alone or with the food. That would not only have a tonic effect, but tend to "loosen" the cough; and should the affection prove obstinate or become chronic, the oil is the very best remedy.

This is the only general treatment that can properly be advised, and rarely, if ever, will any other be required.

CHAPTER II.

PNEUMONIA.

THE lungs are rightly termed "spongy organs," for they abound in cavities, and have but comparatively little weight. In fact, a healthy lung will float on water; and it has been estimated that the number of air-cells in the lungs of a man is not less than six hundred millions.

Pneumonia is an inflammation of the lung substance, characterized by peculiar changes which enable it to be divided into three distinct stages.

In the first, that portion of the lung affected is engorged with blood and congested, and there commences an exudation, something like clotted blood, into the air-cells and little tubes.

In the second, these air-cells and tubes are quickly filled with this exudation, which is now abundant; and by the means of it that part of the lung inflamed is rendered solid and impervious to air. Physicians term this the stage of "red hepatization," because of the color of the lung involved, and its resemblance to liver.

In the third stage, termed resolution, the coagulable exudation dissolves, as it were, and is absorbed. When this change goes on favorably and is completed, the lung is restored to its natural condition; but if the resolving process is interfered with, or does not take place, the affected lung-substance may undergo a purulent change, as when abscesses form, which result in its destruction or death of the sufferer. Another possible accident is gangrenous degeneration or gangrene of the lungs. And still another is chronic pneumonia, in which there eventually takes place hypertrophy of certain tissues of the lungs. But none of these changes often occur in dogs; and with them the rule is that either recovery or death speedily results.

Pneumonia may be limited to a small area, but soon, if not at first, from one-third to one-half of a lung is generally included in the inflammation. Less often an entire lung is involved; and much more rarely are portions of both lungs inflamed during the same attack. Generally, also, there is a decided tendency for the inflammation to extend. That is, although only one-third or one-half of a lung be first affected, the remaining portion of it is quite liable to become inflamed and experience the same changes as the part first invaded.

To ascribe this disease to accidental causes, especially to a sudden chill in consequence of wet and cold, is traditionary; consequently when the theory was

advanced that the disease is caused by a micro-organism, it was for a long time stoutly resisted. However, at the present time this is generally accepted. Yet there are many physicians who are not wholly reconciled to it; and while believing that the vast majority of cases of pneumonia are of germ production, these think that there are occasional instances in which the disease, varying somewhat, perhaps, in character, is caused by other influences, as a sudden fall in temperature, mechanical injuries, etc.

The advocates of the germ theory meet such objections with the plea of susceptibility; that is, that cold, damp, sudden changes in temperature, electrical influences, etc., all of which have been considered exciting causes of pneumonia, are not so, but simply what physicians term predisposing causes. In other words, those influences render all more susceptible to the disease, the lungs then being a more fertile soil for the special germ.

This theory that pneumonia is a germ disease and therefore infectious is by far the most probable one, and evidence to support it is steadily accumulating. Certainly in no other way is it easy to explain epidemics, or the resemblance between the pneumonia of man and the contagious pneumonia of cattle, which is well known to be essentially epidemic and transmissible by contact and inoculation.

Very evidently cases of pneumonia differ much in the matter of infectiousness, and that some are far more infectious than others. Cases differ greatly also in intensity, some of the attacks being mild and quickly recovered from, while in others death occurs within two or three days. If pneumonia is a germ disease, the reason for this variability would appear, for where germs are the cause, the grade of the disease is largely in accordance with their number and virulence; and in mild cases it may be accepted that the patients have taken into their systems either a small number of germs or germs not especially virulent, or their susceptibility to the germs is not great.

No small number of scientists in their practice among mankind have for some years made careful investigations, and found a peculiar bacillus always present in their cases of pneumonia. This has been cultivated and experimented with by some, who claim that an outbreak of pneumonia may be prevented by protective inoculations; while the disease, even when it has been on for a time, may be cured by the same means. If this is so, — and there is scarcely reason to doubt it, — microscopic researches will likely soon uncover the germ of pneumonia of dogs, and prevention and cure be as possible with them by like methods.

While the question as to the nature of pneumonia is under discussion, the reader will do well to assume that it is infectious, and set his course accordingly, if he is so unfortunate as to be called upon to care for a case of the disease. At the same time he can safely accept that it is not markedly so in any instance; and that even in the most virulent cases there is but little danger of its being transmitted if a few reasonable precautions are taken.

The first stage of pneumonia generally lasts nearly two days, but it may be shorter or longer. Usually the first symptom to attract attention is shivering; and this often persists for several hours. Soon there is apparent a change in demeanor, the victim being decidedly dull and sluggish, and inclined to keep near the fire if quartered in the house and the weather is cold; while if in his kennel and called, he comes rather reluctantly, also walks hesitatingly and stiffly. In the course of two or three hours his nose is warm, and likely hot and dry; his eyes somewhat bloodshot; pulse rapid and scarcely below 130; and if the hand be placed between the fore leg and chest, as high as possible, there is no mistaking that he has fever; while if a thermometer is used, it stands near 105° F., and may be as high as 106°.

Thus far his symptoms are merely indicative of a cold; but by the following day, if not before, chest trouble is quite evident, for his breathing has quickened, and there is a short, dry cough at occasional intervals. The expression has also changed; and whereas at first it seemed dull merely, it is now anxious, and it plainly tells that the poor dog is really quite ill. This impression is strengthened when solid food is offered him and rejected. But liquids, like milk, he will generally drink, and with evident thirst.

Very likely for twenty-four hours more there is no great change in his symptoms. They certainly do not improve, and if anything increase in severity. But that period having passed and the second stage entered, evidence that the lungs are affected is much stronger. The breathing is decidedly more affected. The patient is also restless and seems unable to find a comfortable position. The cough is more frequent, but its character continues much the same. The fever is still high, although it may, possibly, have lessened slightly, and the pulse continues rapid. Appetite is totally wanting. The patient will take fluids, however; but although evidently thirsty, he laps sluggishly, halting to "catch his breath" each time that he does so.

The stage of the disease he is now in, consolidation, as a rule, lasts from three to seven days; and until he has passed it, change for the better is not likely to be noticed, that is, if the attack is very severe. The fever, however, in many instances soon declines a little, but rarely falls below 103°. The pulse, on the other hand, seldom falls during this stage, and usually gains somewhat in rapidity, ranging from 130 to 160. The difficulty in breathing continues, and generally increases perceptibly, while all other signs of distress are more and more pronounced as each day passes. The patient may lie down, but only for a moment, because breathing is more difficult when he is in that position, and much of the time he sits on his haunches, with fore legs as widely apart as possible. His eyes grow more and more bloodshot each day, and there forms in them a secretion which flows over and dries, glueing the lids at the corners and the hairs beneath. Except he drops into a doze, when he nods and wakes with a jerk, his head is extended. His mouth is seldom closed for more than an instant,

and his lips and tongue are usually dry, or if not so, they are coated with a thick slime.

The breathing in this stage is generally more distressing than in the first, and it is scarcely possible even for a novice to mistake that the lungs are crippled. It is not merely rapid, as after a hard run, but is labored and noisy, and very evidently requires much effort. Moreover, this difficulty is attended with such significant signs as blowing out of the cheeks and dilation of the nostrils.

Another evidence that the lungs are affected is noted in the lips and tongue and lining membrane of the mouth, all of which, in very severe cases, instead of being red in color become more or less dingy or purplish.

In severe cases the strength fails each day; the expression grows more anxious and pitiful; the eyes sink deeper; and the flesh seemingly melts away, until at last, when the crisis is reached, the poor dog is scarcely a shadow of his former self.

But as a rule, along about the fifth or sixth day from the appearance of the first symptom, if the patient is to recover there comes a change for the better, although at first it is scarcely perceptible, and the earliest indication of it is generally a lessening of the fever. The third stage is now entered, and convalescence begun. The breathing is a little less distressing, and improves almost hourly. There is a marked improvement in the pulse. The cough is less frequent, and decidedly easier. The mouth and tongue, if previously dry, become moist; while if coated with thick slime, that deposit is being replaced by the natural secretion. A good nap is also a most favorable sign. When this has been taken, the patient is generally ready to try a little broth or a bit of raw beef; and from now on the gain is steady and quite rapid.

In cases which progress unfavorably and to a fatal termination, the end usually comes about the fourth or fifth day, although it may be earlier, and it may be delayed several days. In such the most threatening sign appears in the respiration, which is gasping, and clearly suggests that suffocation is imminent. Another very unfavorable symptom is the deepening of the purplish hue of the lips and tongue; and still another is a rapid and great loss of strength.

When death comes, it is often quite suddenly; but in some cases the lamp burns low and slowly dies out, the unfortunate having for many hours exhibited signs that the end was inevitable. Those are inability to sit upright; a peculiar sickening odor to the breath; breathing in short gasps; and coldness of the ears and extremities.

Convulsions sometimes set in during attacks of pneumonia, and may be accepted as evidence of great danger. Delirium can also be detected in a small proportion of cases, but scarcely except by an experienced eye, for it is of a low type. This may be classed with convulsions as a very unfavorable sign.

The presence of pneumonia in severe form ought never be mistaken, for the existing signs all point to the lungs as the seat of the trouble; and while some

of them appear in acute pleurisy, no intelligent person ought to confound these diseases. Pleurisy is very rare among dogs, whereas they are frequent victims of pneumonia. Again, in the former the fever is seldom high, and it soon falls; moreover, the breathing almost always becomes easier in the course of twenty-four hours. Finally, these diseases differ greatly in severity; and a dog suffering from pneumonia is unmistakably very ill, while one with pleurisy, at least at first presents no such positive signs.

Since to recognize a case of pneumonia from the symptoms described is easy, it is not necessary to dwell long upon the physicians' means of diagnosis, auscultation and percussion. Were a case examined early, an educated ear might detect a crackling sound. But this is not loud; moreover, when the ear is at the chest, the hair under it gives off a sound which is almost identical with that emitted by a pneumonic lung.

As for percussion, when applied to the chest over a lung that is solidified, as in pneumonia, the sound heard is flat, whereas there is resonance over a healthy lung. But notwithstanding this means of diagnosis is usually emphasized as highly important, and the impression conveyed that its application is easy, as a matter of fact it is far from being so. Furthermore, it is not required in a case presenting the symptoms already described.

There is one sign which can be considered positive of pneumonia. This may appear if the cough is severe and causes the patient to "gag," and there is mucus expelled. If now that mucus or slime has a reddish tint, the color being due to the presence of blood, it may be accepted as indubitable evidence of pneumonia; that is, if the other symptoms indicative of the disease accompany it. But this so-called "rusty sputa" is not often seen in dogs, for the reason that the mucus secretion in the affected lung is thick and tenacious, and not only is it with difficulty "raised" by the patient, but if it comes up out of the bronchial tube, it generally clings to the throat and is swallowed; moreover, the reddish tint may be wanting, or too faint to be appreciable.

Where the disease is likely to pursue an unfavorable course, signs that are significant often appear early. If at first the temperature is about 105° , and continues as high for several days, the chances are decidedly against the patient. A slight acceleration of the pulse each day may be expected; but if after the third or fourth day it rises very considerably and keeps up, the outlook is unfavorable. The same is true if the breathing, very rapid at first, at no time exhibits any improvement, or increases in rapidity daily. Finally, the danger is always greater when this disease occurs with other diseases, and especially with distemper.

Once pneumonia fixes itself, it must run its course. Its severity may however in some cases be greatly lessened by appropriate remedies, and the patient's symptoms thereafter be scarcely more pronounced and distressing than those of a severe cold; but still the disease must pass through its various stages.

The only medicinal treatment which can be properly advised here is on this line, for the purpose of confining the inflammation to narrow limits; but it can be effectual only during the second, or possibly the third day, while thereafter the caretaker must rely mainly, if not wholly, on good nursing. It is well to add that were this done in all cases, the mortality would be much less than now, when the rule is to drug from the beginning to the end.

When a dog presents symptoms which point to the lungs as the cause, he should be at once removed from his mates, if he has any, and put into a room by himself; the same being large, well lighted, and capable of good ventilation.

Assuming him to be of medium or largest size breed, pills of quinine, each containing five grains, and freshly prepared, should then be obtained, and one given in a thin slice of raw meat, which must be forced far into the throat if the patient will not take it voluntarily.

In the course of two hours there ought to be decidedly less fever, but if it keeps up, another pill should be administered; and this dose must be repeated again after a like interval if there is still high fever.

If the patient is of smaller breed, instead of pills containing five grains of quinine, granules of one grain each should be obtained; and of these three would be the right dose for dogs of the size of fox-terriers, while one would be suitable for the smallest toys, as Yorkshires. The doses should also be repeated twice, after intervals of two hours, unless the fever has abated.

The favorable action of quinine is very pronounced in a large proportion of cases. It not only greatly reduces the fever, but seemingly arrests the progress of the inflammation in the lungs. In some instances, such is its happy effect, in less than twelve hours the patient suffers scarcely more than he would from a common cold; and although he continues ailing for four or five days, recovery is very speedy.

Where the symptoms are strongly indicative of pneumonia it is always advisable to put onto the patient a cotton jacket, for the purpose of keeping the chest warm, relieving the discomfort within somewhat, and obviating danger from cold. To construct such is easy. Take a piece of cotton cloth, flannel, or other serviceable material, long enough to go around the chest and lap three or four inches, and wide enough to cover from the neck to the loins. Estimate the distance between the legs, allow about one inch for the wadding, and cut holes for them. Now put on the cloth and shape it round the neck with pins, after the custom of dressmakers; but no nice fit should be attempted, for the jacket must be padded. This done, remove it, sew the gathers at the neck, and pad with cotton wadding, preferably the glazed, using several sheets. After basting well, put the jacket on again, and sew it at the top. But while it should be snug, it must not be tight; for were it so it would be oppressive, and interfere with the patient's breathing and movements.

This is all that is required in the way of external applications. As for poul-

tices of flaxseed meal or mustard, tincture of iodine, or stimulating liniments, they would all be worse than useless.

He is wise who, in the absence of a thoroughly competent veterinary skilled in canine diseases, calls in his family physician. Professional assistance denied, the caretaker must rely on good nursing to pull the patient through, foregoing entirely the use of drugs.

The need to emphasize this fact is imperative; for there is every reason for the belief that a far greater number of victims of pneumonia are killed by medicine than by the disease. To reduce the fever by means of aconite, antifebrin, phenacetin, acetanilid, or similar agents is generally held the very first essential, and with such the patients are usually dosed, not only during the first days but in many cases throughout the attack. Yet these so-called antipyretics, while they would likely lessen the fever, are hazardous; for, as a rule, they have an unfavorable action on the heart.

In pneumonia that vital organ is the danger-point, and the liability of its failing is always great in severe cases. Aconite, it is true, when rightly used, is practically harmless; and in fact, combined with *veratrum viride*, it will likely lessen the danger of heart failure; but still it is not an agent which one unskilled in the use of medicine should trifle with, especially in this disease; and the same may be said of *digitalis* and all other powerful drugs.

To assist nature by the means of nourishment, good nursing, and stimulants if necessary, should be the purpose always; and the fact should be in sight that if the patient's strength can be kept up until the crisis is reached, and no accidents happen, the chances are about all in favor of recovery.

To well nourish, therefore, from the first should be the rule. As for the foods to be given, buttermilk is by far the best in this disease; and while the patient will drink voluntarily, it should be freely allowed him. But if he turns from it, he may have meat broths and raw meat in suitable quantities.

As long as he will take nourishment enough the caretaker can be content. But sooner or later forced feeding will be imperative; and then sound judgment, patience, and faithfulness must be exhibited.

From the first it is well to add to the buttermilk one or two raw eggs, lightly beaten. The appetite being wholly lost, the foods must be concentrated; because of the difficult breathing the unfortunate cannot swallow easily, and it will scarcely be possible to make him take any considerable quantities.

One raw egg in half a cupful of buttermilk every two hours should well sustain the strength of a large dog. Instead of broths, meat juice is preferable, and for such a dog two or three tablespoonfuls at like intervals would be as supportive.

Failure of the vital powers is always rapid in this disease; and if a caretaker is at all negligent his charge will probably slip from him. He must administer food or stimulants at regular intervals, and every two hours in desperate cases,

while three hours in all others should be the rule. Each feeding, also, should be divided, and in from teaspoonful to tablespoonful doses, otherwise the breathing must be rendered much more difficult by the administration.

In severe cases there is quite sure to come a time when stimulants will be required. This may be reached early, but generally not before the third or fourth day. Great prostration is one evidence that it is at hand. So, too, is a purplish hue of the lips and tongue. But when there is doubt as to the necessity of stimulants, they should be given.

Unless the signs are very threatening, small doses at first should be the rule. Whiskey or brandy is right if the quality is the best; and a teaspoonful in each feeding will be sufficient to commence with, even where the patient is of large size. But when the system is struggling under disease it soon becomes accustomed to agents of this sort, and greater quantities must be given each day than on previous days to have uniform effect. Therefore, in the absence of very urgent signs, it is always well to increase the dose every twenty-four hours by about one-half the commencing dose. But if at any time prostration is rapid or suffocation seems imminent, the stimulants must be pushed; and if the occasion is the fourth or fifth day, there is scarcely any danger of over-stimulation. For a large dog, one or even two tablespoonfuls of brandy or whiskey every two hours in milk can be none too much then.

Where there is prostration, alcoholic stimulants are the best; but when circulation is threatened, as indicated by purplish lips, or there are signs of suffocation, to combine them with the aromatic spirit of ammonia is advisable. The correct dose of that is one-half a teaspoonful; and it should be administered in the whiskey or brandy, the quantity of which at each dose will not be affected by the ammonia, but be the same as when given alone.

A word further as to the use of drugs. Opium in some form has been recommended by nearly all writers on canine diseases, and some advise the use of nervines, as bromide of potassium. The latter is of no value whatsoever in pneumonia. As for the former, in some cases, were it administered with exceeding care and judgment, it would probably do some good, yet as a rule, patients are far better without it. It is generally given by caretakers on their own responsibility, under the conviction that the sufferer should be "eased," and made to sleep at times. The theory is good, but the practice is attended with danger, and far better that the patient retain all his sensibilities than be benumbed by opiates. Therefore, let him fight for breath as long as he is hard driven for it.

As for the cough, the more there is of it the better; consequently it would be folly to attempt to stop it.

The quarters of the patient should be well ventilated always. Pressed for air, he should have that which is pure; and since his chest is well protected by the jacket, a window can be opened frequently if not continuously. An even temperature is also necessary, and about 60° F. desirable.

In view of the probable fact that pneumonia is contagious, also that disinfectants must have a favorable influence on patients whose blood holds the poison of the disease, it is advisable that some one of them be constantly employed in the quarters of the sick. Possibly the best is creosote, which may be conveniently used as follows: Select a shallow tin basin and put into it a quart of boiling water. Add to the same one teaspoonful of creosote. Now if there be a fire in the room, let the basin stand on the stove where its contents will constantly boil gently. In the absence of a fire, place the basin as near the patient as he will permit, and into it from time to time drop a hot stone. By this means a steam will be generated. During the process, which should be resorted to every few hours, the windows and doors should be closed; or over the patient and basin, a sheet being used, a tent can be raised that will hold the vapor until much of it has entered his lungs.

Caretakers should not allow discharges from the nose and mouth to accumulate, but frequently bathe the parts with a solution made by adding about fifteen drops of creosote to a pint of water.

CHAPTER III.

ACUTE PLEURISY.

BETWEEN the lungs and chest walls, on each side, there is a cavity which is lined by an exceedingly delicate membrane called the pleura. The free surface of this is smooth and polished, and kept moistened by a thin, watery fluid, which prevents friction as the lungs alternately fill and empty.

In acute inflammation of this membrane, which constitutes acute pleurisy, the fluid in question disappears, and the smooth surfaces become dry and roughened; and as a natural consequence, there is pain when they come in contact, as they must with every inspiration. The dryness, however, rarely exists longer than twenty-four hours, when there occurs an effusion of a watery fluid, known as serum, into the cavity, and this for the time being separates the pleura. The pain is then much less severe or has wholly disappeared.

The quantity of effusion varies in different cases; and while it might be sufficient to compress the lung and render it temporarily valueless, rarely is it of considerable amount.

Where the disease pursues from the first a favorable course, the absorption commences in a few days after the fluid has reached its maximum, and recovery occurs within two or three weeks. Absorption may, however, be considerably delayed, and if so for a month or more the pleurisy is then chronic. The fluid may even in time change to pus; in which event the disease is no longer pleurisy, but empyema.

Acute pleurisy may be produced by a severe blow upon the chest, and especially if the ribs are fractured. It is also quite certain to speedily follow wounds that have penetrated the chest walls. But in most instances it occurs in consequence of sudden exposure to cold, or is due to extension of inflammation from the lungs or adjacent organs or parts, as in pneumonia, pericarditis, peritonitis, hepatitis, etc.

Attacks are usually sudden, and the first noticeable signs are, shivering, indicative of a chill; some fever; small, weak, and quickened pulse; restlessness, with movements that suggest that the patients are stiff and sore; appetite capricious or wholly wanting; nose hot and dry; eyes reddened and watery; lining of the mouth dry, reddened, and congested, with urgent thirst; bowels and kidneys inactive; dry, short, hacking, and evidently painful cough; quite rapid breathing, which may also be termed superficial, restrained and jerking, as the inspira-

tions are cut short. The breathing is also abdominal, the muscles of the flanks heaving, while the chest walls seem nearly fixed; and in very severe attacks, in which the patients seem to be threatened with smothering, they assume the sitting position, with fore legs apart, which is characteristic of pneumonia.

These are the most pronounced symptoms of the first stage of the disease. During the next, which begins with the effusion of serum into the pleural cavity, the evidences of pain are not so marked, the breathing is less rapid, and the inspirations are deeper, unless the quantity of fluid is great, when the symptoms are much the same as at first; while if it is small, the breathing seems quite natural as long as the animal is quiet and lying down, but quickens on exertion.

A large effusion threatens suffocation, the signs of which cannot be mistaken. It also seriously interferes with circulation, and in consequence the lips and tongue become purplish, and the feet and legs more or less swollen, in the course of two or three days.

It is never easy even for an expert to determine positively the presence of this disease. During the first stage the only purely diagnostic sign is a slight sound caused by the dry and roughened opposing surfaces of the pleura as they rub in inspiration. A trained ear at the chest might detect this sound in some instances, but only in a few; for it is too slight and short, ending almost as soon as it has commenced.

As for a positive diagnosis during the second stage, one could scarcely be reached were the quantity of fluid small; but if very considerable, its presence might be determined by percussion, which is performed as follows: Press the palm and fingers of the left hand firmly against the side of the chest, and tap lightly on one finger with the second finger of the right hand, giving sharp, quick blows. If the sound resulting is dead and flat, like that heard when one performs this operation on his own thigh, it denotes an absence of air in the part of the chest beneath the finger; whereas were the conditions normal, — all within the suspected side of the chest healthy, — the sound emitted would be much like that heard in percussion of the top of a table. And the absence of air in the chest, or a considerable diminution of the usual amount, indicates either the presence of a fluid in the pleural cavity or solidification of the lung, as in pneumonia.

Another means of diagnosis is auscultation or listening while the ear is firmly pressed against the chest. In health the respiratory sound is distinctly heard in this position; but in pleurisy it is either unappreciable or only feeble, excepting in cases in which the quantity of fluid is sufficient to compress the lung so that air cannot enter it — when the sound heard is even louder than on the unaffected side, and is much like that appreciable when the ear is placed to the front of the neck of the sufferer.

An evidence of the presence of a very large effusion is a bulging between the ribs.

During the first twenty-four hours the symptoms of acute pleurisy and those of pneumonia, in the majority of cases, bear some resemblance. But there is seldom high fever in the former, and the thermometer rarely shows a higher degree than 102° . Moreover, it usually falls to near the normal the second or third day of the attack; whereas in the latter, even in mild cases, the temperature generally ranges from 104° to 105° , and continues high for nearly a week, or more.

Acute pleurisy alone is likely to endanger life only where the amount of effusion is very great or the general health was poor at the time of the attack.

As stated, a large effusion threatens suffocation, but such rarely forms unless the fluid becomes pus; while empyema is seldom encountered even by the most experienced.

Acute pleurisy sometimes becomes chronic, but that result is not at all likely if the victim is fairly strong and under good hygienic conditions.

Very evidently the effusion of fluid is conservative; for did it not occur, the inflammation in the pleura would not only persist for a long time but be intensified by the surfaces rubbing together, and the pain and danger of life be correspondingly greater. And even were recovery to take place, — which is doubtful, — the opposing sides of the affected membrane would grow together, as it were, and the lung be considerably crippled; while the affected side of the chest would be more or less retracted or sunken in.

In some cases the inflamed pleural surfaces become somewhat adherent to each other, but seldom if ever, excepting here and there by occasional bands or attachments, which merely limit somewhat the lung's expansion.

Since this disease is so very uncommon, it is not advisable to dwell long on treatment. If a diagnosis is possible, to apply dry, hot flannels to the affected side, restrict the diet to liquids, and keep the patient in a comfortably warm, well-ventilated room, is about all that will be required in most cases. If an effusion of considerable quantity occurs, it will generally disappear under careful nursing; or should it not do so, it will be necessary to tap the chest and evacuate the fluid — an operation which must be intrusted to skilled hands only.

In every case in which it is impossible to determine whether the patient is affected with pleurisy or pneumonia, it should be assumed that he has the latter, and he be treated accordingly until the fact is evident that a mistake has been made. Observing this rule, if one is at fault no harm can result; while to delay the proper treatment in the severer malady, or apply to it the measures suitable for the milder, would be serious indeed, and the chances of the victim greatly lessened thereby.

CHRONIC PLEURISY.

An acute pleurisy may become chronic, but there is only slight danger of its doing so except in feeble subjects; and as a rule, chronic pleurisy is such from the first, the pleural inflammation developing imperceptibly.

This disease sometimes occurs in dogs, but it is very rare; moreover, its detection is even more difficult than that of acute pleurisy, consequently merely a brief consideration is warranted.

The same influences which excite the acute may give rise to the chronic form; but usually the latter fixes itself upon subjects in whom the health is considerably impaired; and the direct causes are then not easily determined.

Generally the symptoms are very obscure, and only point to the lungs in a small proportion of cases. The conditions of the pleura somewhat resemble those in acute pleurisy, but the inflammation is of a low or mild type; there is but little if any fever; pain is not appreciable, and the breathing scarcely affected except on active movements, when it becomes quicker than in health. There may be some effusion; while the pleural surfaces are even more inclined to become adherent than in the acute form of the disease, and the adhesions cripple to some extent the lung, causing the chest wall to permanently flatten or sink in.

Recovery from this disease is possible, but it is not likely to take place except in dogs having strong constitutions and that are very healthfully placed. The rule is, once the disease occurs, the health is slowly and steadily undermined. The lung being crippled, circulation is implicated, and ultimately the victim worn out with resulting complications of all the vital organs.

Were the symptoms so pronounced that the disease could be clearly made out, and there was a large amount of effusion, the proper course to pursue would be to tap the chest. But cases of large effusions are extremely rare, while patients in whom a positive diagnosis is possible are rarer still; consequently the only general line of treatment which can properly be advised here is purely hygienic; that is, it consists of good, wholesome food, healthy quarters, and a reasonable amount of easy exercise each day.

EMPHYEMA.

While dogs are not exempt from this disease, it is by far the rarest of chest affections, and never likely to occur excepting where the walls have been punctured, as by a shot, or the lungs are much diseased, as in tuberculosis.

It is practically pleurisy in which the effusion of serum has changed to pus, and the affected side of the chest become a huge abscess. This fluid must be evacuated or recovery cannot take place; and while the disease in man generally

requires that an opening be made in the chest wall, by means of a knife, for the escape of the pus, in dogs a spontaneous opening is likely to occur early, and before a positive diagnosis can be made.

Great loss of weight and strength, quickened breathing, some cough, fever at times every day and alternating with chills, are the most prominent symptoms; and, as it will appear later on, they are identical with those of tuberculosis.

When a pleural cavity contains much pus, the victim shows by his manner that the affected side is heavier than the other. There is also bulging between the ribs, and this is marked at the point where perforation is to take place or the pus break through.

As for treatment, a consideration is not necessary; for even were the pus evacuated, the chances of recovery would be small indeed; while if it took place, the patient would be practically ruined.

ASTHMA.

It is quite the custom to term asthmatic all attacks of difficult breathing occurring suddenly without apparent cause, and in dogs apparently otherwise well. Yet, although they are not exempt from it, true asthma is very rare indeed among them. It is a spasmodic affection of the bronchial tubes, which narrows them and greatly obstructs the passage of air. While its actual and direct cause is in dispute, the accepted theory is that it is due to reflex nervous action; also, that this in turn may be excited by certain irritant inhalations, growths or peculiar morbid conditions in the nose, and possibly by intestinal disorders. But when it occurs in dogs, although other causes have been assigned, it is very generally attributable to worms which have made their way up from the stomach.

What are usually termed asthmatic paroxysms are often noted in pets that are exercised on the chain and tug at the same; but in such cases the trouble is not asthma, nor is it in the bronchial tubes, but it is confined to the larynx, in which there is spasm caused by the pressure of the collar, and in consequence the air-passage is greatly narrowed. In a word, it is identical with the false croup of children.

Very old dogs generally, and others loaded down with fat, are "short winded;" and on considerable exertion their respiration is labored and wheezing. But obviously this is not asthma, although often termed such.

In cases in which circulation in the lung, and perhaps generally, as in heart disease, is impeded, paroxysms of asthma sometimes occur. They are also possible in long-standing and severe cases of bronchitis, in which the lining of the bronchial tubes is thickened from congestion. In these instances the affection has been termed "congestive asthma."

Asthmatic paroxysms can scarcely be mistaken. They occur suddenly ; the respiration is not increased in frequency, in fact, at times, it is less rapid than in health ; the inspirations are jerking, and the expirations wheezing ; and with these symptoms are associated the usual signs of the existing sense of suffocation, as a piteous and anxious expression, etc.

The significance of such attacks depends upon the causes and conditions which induce them. Alone they do not threaten life. But once they occur, the chances are that they will appear again and again ; although, as a rule, only at long intervals.

Ordinary attacks scarcely require treatment, for generally they end in the course of ten or fifteen minutes. If, however, they persist, or are very severe from the first, the victim should be placed in a small room and treated to the fumes of stramonium leaves and nitrate of potassa, the same being well mixed, in proportions of one ounce of the former to one dram of the latter, and thrown onto a pan of coals. Considering the quantity of this that ought to be used, a teaspoonful should be burned every five minutes until the patient is relieved or the attendant has grown dizzy.

An emetic will also afford prompt relief in the majority of cases ; and either ipecac, common salt, or the sulphate of zinc may be employed.

As for curative treatment — that is, to remove the cause and prevent attacks — there is nothing in the way of medicine which promises well, and reliance must be placed on hygienic and dieletic means. If the victims are badly housed, and especially in stables, they should be put into out-of-door kennels or be otherwise as healthfully placed ; while the diet must be greatly reduced and simplified if they are fat and disinclined to exercise.

TUBERCULOSIS.

Pulmonary tuberculosis, popularly termed consumption, is a disease characterized by the presence of morbid deposits called tubercles. These are scattered more or less abundantly throughout the substance of the lungs, and appear as small, grayish granules about the size of millet seeds. In time they generally unite, and form nodules or bunches, which vary in size. The parts adjacent to them are inflamed ; the tubercles tend to soften, break down, and become liquefied ; ulcerations follow ; the lung tissue affected is destroyed, and cavities form.

It is now very generally accepted that the real cause of tubercle, of every form, is a microbe, to which the name bacillus tuberculosis has been given ; also that whereas once this disease was supposed to be caused directly by bad air, unwholesome food, close confinement, in-and-in breeding, neglected colds, and the

like, the prevalent belief is that these influences cannot of themselves cause tuberculosis, but are capable merely of rendering the tissues susceptible to the invasion, and favorable to the growth of the microbe in question. In other words, a healthy lung does not attract this germ, nor are its conditions right for propagation. On the other hand, a lung that is not healthy, because of the unfavorable influences mentioned, is good soil for the bacillus, and in it that germ will thrive and multiply.

It is held by some that tuberculosis in the dog is an extreme rarity; but this notion has been ably refuted by investigators, one of whom has reported that out of 7,000 dogs examined 27 were tuberculous, or 1 in 250. It has also been demonstrated that in these animals the lungs are the organs most frequently affected; and after them come the liver, serous membranes and kidneys.

It may, moreover, be accepted that the direct cause of this disease in dogs is the same as that of tuberculosis in man, for the bacilli in both are identical. Furthermore, since in not a few instances dogs belonging to tuberculous people have died with tuberculosis, it is fair to assume that they were directly infected by those people.

Considering certain natural peculiarities, their great lung powers and tendencies to keep them vigorous by exercise, it may indeed be accepted that tuberculosis is never likely to occur among dogs unless they acquire the disease from the human family. And even when exposed to it, if they are much at liberty, their quarters are healthy, and food sufficient in quantity and wholesome, the danger of infection is very slight, because their lungs and other vulnerable parts of their systems will resist the bacillus of the disease. On the other hand, if dogs under unhygienic influence are exposed to tuberculous people, their chances of "taking" the disease are very much greater.

For the purpose of illustration, it is assumed that the dog is a toy and his mistress a victim of this grave malady. He has but little exercise, is over weight, and otherwise his powers of resistance against disease are decidedly below the normal. Much of the time he passes on the bed of the patient. He is given her food remnants, and laps her plates and saucers. All these must, of course, be more or less contaminated with the bacilli of her disease, either through her lips, spoons, forks, or possibly knives. Her sputa may now and then drop on the floor, and the chances are that he laps it. Beyond this, a great pet and company for his poor mistress in long weary hours, he doubtless "kisses" her often. He also sleeps in her arms at times and breathes the expired air loaded with the microbes of her disease.

Assuredly a dog so placed would likely be directly infected with tuberculosis, either through his alimentary canal or respiratory passages; and if he failed, wasted away, and followed his mistress to the "great unknown" within a year, the conclusion would be justified that he had succumbed to the same disease.

Indeed, dogs should never be admitted to the rooms of persons suffering from

tuberculosis; and were such rule never violated, this disease, in their kind, would be one of the greatest of rarities. But of course dogs can acquire it from other lower animals. The tuberculosis of cows, for instance, is believed to be identical with that of the canine and human races. But manifestly the chances for infection from these lower animals are less than from man; although were dogs fed continuously or even frequently on milk from cows well advanced in tuberculosis, there would be great danger of their ultimately becoming tuberculous.

The importance of excluding dogs from the rooms of sufferers from this lung disease rests not alone on the danger of immediate infection. Surely there is even the graver danger of the bacilli being conveyed back to other members of the family. First the sufferer dies. The dog does not show signs of the same fatal disease possibly for several months afterward, during which period he may be passing his nights on the bed of some other member. And when he fails, naturally he is the object of greater solicitude, and petted and fondled even more than when well.

Now it is a lamentable fact that the cause and methods of infection of tuberculosis are not generally understood; moreover, the germ theory is stoutly resisted by people generally, and in only comparatively few cases of this disease in mankind are the measures of prevention faithfully applied. Consequently it continues to exist; whereas it might be nearly if not quite stamped out were reasonable and comparatively easy precautions taken, such as cleanliness and good ventilation of the sick-room, proper disposition of the infectious excreta, disinfection of articles in use, and destruction of all germs of the disease after death by the free use of proper chemicals, whitewashing, etc., in the infected apartments. But this is seldom done, consequently when one member of a family dies others occupying the same quarters are likely to fail in health somewhat, if not in turn succumb to the disease. Now add to their possible sources of infection a tuberculous dog, and it would indeed be surprising did he not greatly intensify the danger, especially for young and puny children. He would also likely directly infect some of his people who otherwise might not be susceptible to the malignant germs left in the cracks of the sick-room floor, walls, or ceiling.

Therefore, to exclude dogs from tuberculous people should be the invariable rule. Here another rule, no less important, can be laid down, namely, exclude from the house all dogs which have been exposed to tuberculosis with good chances of contracting the disease, and destroy them at once on the appearance of signs that they have been infected.

It is not necessary to dwell long on the symptoms of this disease, since they so closely resemble those which appear in human sufferers. A persistent although slight cough in a dog that has been exposed to a tuberculous person or animal should be held a very suspicious sign. Beyond this, were his appetite poor, did he lose vitality and flesh steadily, his coat become dry and rough and

fall out, and attacks of shivering followed by fever occur almost daily, then it might rightly be assumed that he had tuberculosis.

Considering the very evident fact that a victim of this disease is a source of great danger to his people as well as his mates, undeniably he should be promptly destroyed.

While a cure in the early stage might be possible, it should not be attempted; for the chances of it are too small, and the dangers of infection too great.

CHAPTER IV.

INFLUENZA.

INFLUENZA, as it generally manifests itself, is a combination of coryza and bronchitis, attended by more severe constitutional disturbance than usually exists when these diseases occur together. For instance, there is much depression, which often in time becomes great prostration, soreness throughout the body and limbs sufficient to suggest rheumatism, complete loss of appetite, and high fever. In fact, this disease is a veritable acute catarrh of considerable extent and great intensity; and it might, without impropriety, be called a "hard cold all over."

It runs the course of the nasal and bronchial affections named, and their various changes characterize it; but while in some instances recovery takes place as speedily in this disease as in them, as a rule it is slower, and may be delayed for several weeks, or possibly months.

Although the etiology is still uncertain, considering that it appears as an epidemic and is not dependent on bad weather or exposure, beyond doubt its direct cause is a germ.

It only rarely attacks dogs. When one falls a victim to it, others in the neighborhood are sure to be attacked; consequently its real character soon becomes known, and there is but slight danger of its being mistaken for pneumonia, to which, from its high fever and great prostration, it bears some resemblance.

But seldom does recovery fail to occur; and in fatal cases there is almost always some serious complication, and generally pneumonia.

The best medicinal remedy, efficacy and safety combined, is the sulphate of quinine; and this should be administered in the same doses, repeated as often, and after the same intervals, as in pneumonia. Reliance should afterward be on good nursing, stimulants being given if there is very great prostration, but not otherwise. To feed generously from the first, employing force if necessary, should also be the rule in very severe cases.

ULCERATIONS IN THE NASAL CAVITIES.

When ulcers form in the nasal cavities the affection is often mistaken for ozæna, to which, however, it is not related, notwithstanding in some of its most

prominent symptoms there is a striking resemblance. Such ulcerations are very rare indeed in dogs; and when occurring in them they are almost always due to foreign bodies lodged in the nose, or to injuries, as from a blow, in which bones or cartilages therein are broken, and there is necrosis or death of the former.

A purulent, foul-smelling discharge, offensive breath, and more or less obstruction to breathing through the nose, are the symptoms indicative of this trouble. There is also, as a rule, notable impairment of the general health.

As the actual cause can rarely be determined except by thorough examination of the nasal passages, the services of a professional will be required, and treatment should be left to him; but even an unskilled person would be justified in exploring the nasal passages for the purpose of determining if there is an obstruction, provided always he used a piece of small rubber tubing, such as that attached to certain kinds of infants' nursing-bottles. With it he could not do harm. He ought, moreover, be able to detect obstruction; and where the same is a foreign body and not deeply embedded in swollen tissues, he might possibly push it back into the throat, from which it would be speedily expelled.

In any case in which professional assistance cannot be obtained, it would be advisable to explore the nasal passages by this means, and follow the operation with daily injections of the peroxide of hydrogen, as recommended when worms are lodged in the nose.

OZÆNA.

Ozæna, often termed stink-nose, is a chronic disease, which is generally classed as one of the varieties of nasal catarrh, but scarcely with propriety, for its source is not in the nasal passages, but in adjacent cavities, although it manifests itself by an extremely fetid, offensive discharge from the former.

This complaint has its origin in a catarrhal inflammation in some one of the stated cavities. The secretion in the same soon becomes pus, which, being retained, undergoes degeneration. Escaping from the place of formation, it runs into the nasal passages, where it accumulates and forms foul-smelling masses, which are only expelled with difficulty, and but rarely until they have been retained four or five days. And as soon as they are removed, other masses speedily fill their places.

This discharge and an equally offensive breath are the pronounced symptoms of the disease; and with them there is generally quite persistent sneezing. The breathing through the nose may be obstructed, but not necessarily at all times; for after the accumulated masses have been discharged there is seldom any considerable impediment to breathing through the nose until others are formed. Nor is careful examination of the nasal passages, which some authors urge should be

made, likely to reveal the cause; for it is not located in them, but, as stated, in some accessory cavity, and therefore out of sight.

Fortunately this disease is but rarely encountered among dogs; also, that it can scarcely be mistaken; for although offensive discharges from the nose are characteristic of "Ulcerations in the Nasal Cavities," and "Worms in the Nose," those affections have peculiarities which are quite distinctive.

If the disease is of recent origin it can be cured, but the gain will be slow; whereas if it has existed long the outlook is very unfavorable.

It is believed by some able investigators that the actual cause of this disease is a specific organism or germ, and one of them has recently claimed to have established its identity. But the question of etiology must remain an open one until experiments have proved this or similar claims. However, the germ theory is highly probable, and treatment can rightly be applied in accordance with it.

The peroxide of hydrogen promises best, and should be used — in solution of the same strength and as often — as advised for "Worms in the Nose."

WORMS IN THE NOSE.

Now and then worms make their way out of the stomach and up into the nasal passages. But such accidents are extremely rare. Another, also very rare, is the appearance of the maggots in these cavities. In the first instance, sneezing, pawing at the nose, and similar evidences that it is seriously disturbed, are the signs manifested; and very generally the intruders are quickly dislodged by the vigorous efforts of the host. Not so, however, with maggots or so-called screw-worms, which fasten themselves to the mucous membrane, and considerable force is required to detach them.

When fully developed, the screw-worm is three-quarters of an inch long and about an eighth of an inch thick. It is made up of segments, between which there are rings of bristles. These cause some resemblance to a screw; hence the name.

Where the worms have invaded the nose they have been found in large numbers, — over three hundred in one instance. After a time they usually set up a bleeding, which proves very obstinate, and exhibits a very decided tendency to recur at frequent intervals, if not persist. When this is absent there is a constant discharge of a malodorous, watery fluid from the nose and mouth. The eyes are usually swollen, and perhaps nearly closed; while the parts anterior to them are puffed out, rendering the expression hideous.

They are immediately killed by chloroform applied by means of an atomizer, but a highly efficacious treatment is syringing the nose with the peroxide of hydrogen. This should be diluted with three parts water; for were it used full strength the foaming caused might choke the patient.

As a rule, only two or three such applications will be required, and on successive days; but they should be kept up, once daily, as long as the maggots are being discharged.

The parasite *pentastoma tænioides* sometimes invades the nose; and while generally it causes a severe form of coryza, it may be present in the sinuses of the forehead and excite grave brain symptoms and death without producing any noticeable nasal trouble. Such brain symptoms also usually bear a close resemblance to the most pronounced signs of rabies, — as intense excitement, snapping and biting, and even paralysis of the lower jaw.

Their essential treatment has been described in the discussion of Coryza.

NASAL POLYPUS.

A mucous or gelatinous polypus is a tumor which springs from some small point on the lining membrane of the nasal cavity, and grows with more or less rapidity until it fills the nasal passage and closes the opening. It is a soft and jelly-like mass of a grayish color, and mainly composed of mucin, the principal constituent of mucus.

In extremely rare instances dogs are victims of these tumors; and when so the fact is readily perceived if they are of goodly size, for they protrude from the nostrils, and especially in damp weather, when they absorb moisture and swell considerably. Small polypi, however, are not easily made out; but obstructed respiration through the nose, stuffiness, frequent sneezing, and a constant discharge of clear watery fluid from one nostril, would suggest their presence.

Removal by means of wire snares is the proper treatment for nasal polypus in man; but an expert is required for the operation, which if not skilfully performed will seldom prove effectual, for unless the tumor is all removed it generally reproduces itself. Such operation, however, and as successful, in a dog is almost wholly out of the question; and the treatment advisable is to inject into the tumor, with a hypodermic syringe, a solution of tannin and water — twenty grains to a drachm — which will generally cause it to shrivel, dry up, and eventually come away.

SECTION II.

DISEASES OF THE BLOOD AND CIRCULATORY SYSTEM.

CHAPTER I.

ANÆMIA.

ANÆMIA, commonly termed poverty of the blood, is an abnormal condition characterized either by a diminution in the quantity of the blood or a deficiency in one or more of its constituents.

It is often found in poorly arranged or badly managed kennels — particularly among the young, delicate, and highly bred — where the atmosphere is damp or vitiated by filth, sunlight cannot enter as it ought, or there are displayed careless and erratic methods, and especially poor judgment in feeding.

An excess of starchy foods and insufficient meat, prolonged suckling of litters, too frequent whelpings, imperfect digestion, and lack of exercise, are a few of the many influences that are capable of producing anæmia. To this list may be added short and severe or long-continued but slight hemorrhages, persistent diarrhœa, or attacks of other debilitating affections; also parasites, both external and internal, the former slowly undermining the general health by their constant annoyance, and the latter abstracting no small part of the nutriment which should go to nourish their hosts.

In dogs affected with anæmia the mucous membranes of the mouth, gums, and lips have lost their bright red color and become pale; the tongue is no longer moist, as in health. Its color also has changed and become pale or light pinkish. In severe cases the temperature of the body is below the normal; the action of the heart is feeble and irregular; consequently the pulse is small, unsteady, weak, and quite rapid. The respiration is more frequent, and even comparatively slight exertion causes distress and panting. There is loss of strength; and now and then it would seem as though but little power remained in the legs, because of a decided tendency to drag the feet instead of lift them fairly. The manner of the victim is languid, indifferent, and listless; his skin is dry, and has lost its smoothness and elasticity, while his coat is harsh and rough, his urine scanty, and bowels are quite generally sluggish and inactive. There is, moreover, a lack of functional energy in all important organs of the body, also in vital processes, as

digestion, which is decidedly impaired. Unusual excitability of the nervous system exists, and consequently convulsions are easily induced.

Anæmia may be associated with and dependent upon other diseases which involve an undue expenditure of blood constituents, and manifestly they must be duly considered in adjusting the treatment. In simple, uncomplicated anæmia the patient should be as healthfully placed as possible, — in dry, clean, well-lighted and well-ventilated quarters. His food should be nutritious and easily digestible, also generous in quantity; and, as a rule, it should consist largely of meat, a goodly proportion of which should be fed raw. Vegetables need not, however, be withheld; indeed, considering the sluggish condition of his kidneys and bowels, greens especially are indicated for their peculiar effects. Fish and eggs are wholesome accessory foods. Good rich milk may be allowed now and then, but if given often and in large quantities its effect would be prejudicial.

Of the various tonics the iron preparations are the most serviceable in this affection. The tincture of iron may be given in the following doses, three times daily with the food: —

For largest breeds, twenty drops; medium size, fifteen drops; fox-terriers and the like, ten drops; toys, five drops.

Each dose should be diluted in from one to two tablespoonfuls of water.

Where the appetite is poor, the addition of quinine is advisable, and the tonic may wisely be the citrate of iron and quinine in doses as follows: —

For largest breeds, five grains; medium size, three grains; fox-terriers and the like, two grains; toys, one grain.

Each dose ought to be in pill form; and one pill three times daily with the food should be the rule.

In very high-strung and nervous subjects the elixir of calisaya, iron, and strychnia is indicated, and may be given three times daily, with the food, in the following doses: —

For largest breeds, one teaspoonful; medium size, three-fourths of a teaspoonful; fox-terriers and such, one-half a teaspoonful; toys, fifteen drops.

Of ferruginous preparations quite the best are those in which the iron is combined with manganese, because they are well borne by the stomach, which is not the case with many other forms of iron. Such combinations are on the market under various names, and a wise choice can be easily made with the assistance of the druggists patronized. The dose can also be readily adjusted. If it is one tablespoonful for adults, the same may be given to largest breeds; three-fourths to dogs of medium size; one-half to fox-terriers and the like; one-fourth to toys.

Another very excellent preparation, when honestly made, is the beef, iron, and wine; and it is especially adapted to very delicate subjects, to which it may be given every three hours.

Eczema is present in many cases of anæmia, and for such the arseniate of

iron promises well. Pills of various strengths can be obtained ; and those containing about one-eighth of a grain will be right for largest breeds, about one-fifteenth for medium size ; one-thirtieth for fox-terriers and the like ; one-fiftieth for toys. It should be given three times daily with the food.

Faithful grooming, massage, and ample exercise in pure air, assist much in enriching the blood and restoring the health.

PLETHORA.

In general terms plethora is the opposite of *anæmia*. That is, instead of too little blood or a deficiency of some of its normal constituents, there is too much blood or it is too rich in certain of its component parts, as red corpuscles or *hæmoglobin*.

A plethoric dog is round and plump but not necessarily fat. His blood-vessels are full, and the mucous membranes of the mouth and nose are continually of that deep red color which ordinarily appears only after long runs. His heart's action is unusually powerful, and pulse full and strong ; while, as a rule, he has a dull, heavy, indolent, or sluggish manner, and is decidedly averse to making much exertion. Such a dog in early life is more liable than others to fall a victim to acute inflammatory diseases, and after middle age, to various chronic diseases, and especially cancer.

Dogs that have strong digestion are apt to become plethoric if they eat too much, and the chances of that change are greater if hard work is not done. It is among the largest breeds that this trouble is most often found, because they are the least active ; and although they may exercise much, they rarely do so violently, and the slow work, as walking, they get really favors their acquiring an over-abundance of blood ; whereas the medium size or small breeds walk but little and often run hard and fast, unless of course they are pampered house-pets. Thus in them the waste is greater, and even if food is taken in excess it is used up or carried out of the system, instead of being left to unduly augment blood and tissues.

Aside from its tendency to cause congestions and favor indolent habits, plethora has certain penalties, one of the most serious of which is the liability to skin eruptions, notably *eczema*. Indigestion and so-called biliousness are also likely in time to be associated.

To remedy the trouble is easy. The daily amount of food allowed should be of reasonable quantity only ; and if the diet has consisted too largely of meat, which is generally the case, the proportion should be reduced somewhat, and vegetables, especially greens, substituted. In the beginning of the treatment a laxative may be required.

Ample exercise is of great importance, but it must be properly regulated ; not be too severe at first, and increased gradually, for otherwise the consequences might be disastrous.

HEART-DISEASES.

The heart is a hollow, muscular organ, the engine of circulation, or the forcing-pump which keeps the current of blood in motion. It is partitioned to contain four chambers or cavities. The two on each side communicate with each other, but there is no connection between the sides. Each chamber has two openings, an inlet and an outlet ; and these are provided with valves, which open to admit the entrance of the blood, and close tightly to prevent its return. The passage of the blood through the heart is easily described. It returns by the veins from the different parts of the body and enters the upper cavity on the right side. When that is filled its walls contract and impel its contents into the lower cavity ; the walls of which in turn contract and force the blood into and along the great artery of the lungs. That blood, which was dark and impure when it entered the lungs, soon leaves them bright and pure, and returns to the heart ; this time entering it on the left side. From the upper to the lower cavity it passes, as on the other side, and is then delivered into the arteries and distributed throughout the body. Thus the movement of the blood through the heart is accomplished by alternate contractions and relaxations of its muscular walls, and each of these successive movements is called a beat or pulsation. The base of this vital organ is so attached that it is securely held in place, while its tip or apex is freely movable and knocks gently against the inside of the chest. To avoid friction it is enclosed in a sack called the pericardium, formed by two layers of a thin membrane, the inner surfaces of which are as smooth as satin, and at all times made slippery by a fluid that is poured upon them.

If the ear be placed to the chest directly over the apex of the heart, when the beat is felt two sounds will be heard. These are believed to be caused by the closure of the valves. The first is louder and stronger than the second. This and other differences in character between them are attributed to the differences in the arrangement of the two sets of valves. In disease of the heart, during the course of or following which either of the valves become defective, the heart-sounds in question are changed. There is a slight difference in the sound made by the shutting of the valves, due to imperfect closure of them, or an unnatural sound is added ; and this is produced by the current of blood as it passes through one or more of the orifices of the heart at which the valves are located, and is in consequence of those openings being diminished in size. That narrowing of the openings is one of the products of disease, and generally due

to atrophy, calcareous degeneration, or calcareous or fibrinous deposits on the lining membrane.

The difficulties in the way of detection of heart-disease with near certainty are great, for the evidence is mainly in the heart-sounds; and only a very slight modification may be positive proof of a fatal malady. The ear, therefore, must be relied upon in making a diagnosis, and it must necessarily be very highly trained. In man one sound is fairly sharp and distinct; the other is comparatively dull and prolonged. First provided with a good anatomical and physiological knowledge of the heart, and afforded abundant material and opportunity to listen to and study different hearts in healthy men, one after a time becomes able to detect abnormalities in the sounds and draw right conclusions; but such advance is slow, tedious and far from easy. Yet the study of the heart of dogs is attended with far greater difficulties than that of man, for in the former, even during perfect health, the sounds are indistinct and incomplete. It cannot, therefore, be encouraged, or this discussion be rightly more than a brief and passing notice.

VALVULAR DISEASE.

Inflammation of the heart affects chiefly either its lining membrane or the membrane that covers it, to which allusion has been made, called the pericardium. The former is termed endocarditis and the latter pericarditis. Both forms of heart inflammation occur most often during acute inflammatory rheumatism. Endocarditis generally affects the valves of the left side of the heart; and one or both of them may be so distorted that they either do not close perfectly or the openings they control become contracted. In consequence of imperfect closure of a valve, more or less of the blood that has passed through it flows back; while a contraction of an orifice retards the passage of blood. Such defects interfere with circulation, and to compensate for them the heart must work harder or faster, or both. As a result it first undergoes hypertrophy; and after the limit of that change has been reached, the walls of the organ become dilated, and consequently weakened. In the meantime the entire organism is more or less disturbed by the cardiac abnormality, although it may exist for a long time without causing grave symptoms.

Endocarditis is now believed by many to be of germ origin, one or more germs being invariably accountable for its production.

When following inflammatory rheumatism, valvular changes may begin within a few months and progress quite rapidly; but, as a rule, it is not until several years after the rheumatic attack that little growths, somewhat like warts, spring up from the lining membrane on or near the valves, or the openings they guard commence to narrow. These changes well advanced, the symptoms induced are unduly quick-

ened and labored heart action after exertion, also hurried and difficult respiration, blueness of the lips and mucous membranes elsewhere, digestive and nutritive disturbances, and finally kidney complication and dropsy.

Notwithstanding serious defects in the valves and obstructions in circulation, for which there is no cure, the victim may live and be in seemingly fair health for several years.

HYPERTROPHY OF THE HEART.

As previously stated, when its valves are defective or there is resistance to the passage of the blood, the heart is forced to work harder to maintain proper circulation; and to enable it to meet the increased demands it slowly enlarges or undergoes hypertrophy, up to a certain point. Hypertrophy may, however, result from habitually excessive exertion, as in coursing and jumping. Quite invariably this change is at first uniform, all parts alike undergoing enlargement; and if the heart were not forced to over-labor very hard, it would likely remain merely larger than normal, and not experience any change that could lessen its powers or be prejudicial to health. In other words, were it well nourished, allowed intervals of rest,—the excessive exertion occurring only occasionally and not habitually,—and the increased demands stopped within certain limits, like any other muscle the heart would grow with exercise, and there be nothing really abnormal in its enlargement. But, as a rule, when forced to labor unduly, and always where the blood does not circulate as it ought because of valvular obstruction, the trouble that occasions the overwork grows steadily more pronounced and serious; therefore the enlargement must continue after the safety-lines have been reached. It is then not limited to muscular growth and thickening of the walls. The latter become steadily thinner, and the heart is stretched or dilated, and in corresponding degree it weakens continuously.

Only a professional can determine when hypertrophy of the heart exists. Manifestly the proper treatment for it is to lessen the amount of work and exercise.

FATTY DEGENERATION OF THE HEART.

When dogs become obese, fat is deposited throughout the system, no part being exempt from the infliction. In the heart, as well as in the kidneys, liver and other organs, it is embedded, and invariably seriously weakens if its amount is considerable and sufficient to interfere with organic workings. It is a well-known fact that a lean muscle is stronger and more enduring than one that has had a considerable proportion of its fibres displaced by oil globules or fat; and

certainly the heart is no exception. A small amount of infiltration may not have serious effect; but beyond limits, reached when the subject is much overweight and the change has long existed, the heart is very liable to give way if any unusual and excessive demand is made upon it, as when a dog is forced to follow for considerable distance a rapidly moving team.

Fatty degeneration may occur previous to middle life, but until then it is rarely of import so serious that sudden death is liable to occur from failure of the heart or rupture of its walls under intense strain.

Occurring in early life and with general obesity, the fat can be withdrawn from the heart and its ill effects largely obviated, provided it has not been very long there. The essential treatment is the same as that demanded in obesity, exercise being carefully adjusted during its application.

PALPITATION OF THE HEART.

In some breeds oftener than in others, and especially in dogs that have been much inbred, the heart beats much more rapidly and violently under exercise than it ought, considering the exertion and excitement. Oftentimes also in such subjects there is rapid heart action without apparent cause. This condition existing in the absence of disease of the heart, the trouble is a functional disturbance merely, which in mankind is termed palpitation.

Dogs exhibiting it are, as a rule, excessively nervous and easily thrown into convulsions. It is therefore advisable to manage such differently than others not similarly affected. There is always a danger of allowing them too much meat, and the quantity should be carefully restricted, while vegetables and starchy food should be largely relied upon. Manifesting as they do a general tendency to immoderation, in the matter of exercise especially they should be under wholesome restraint.

While medicines may not appear necessary, cod-liver oil, one of the best nerve-foods, can always be wisely given for several weeks; and under its use the subjects are quite sure to "steady down" somewhat, and greatly improve generally.

PERICARDITIS.

While inflammation of the pericardium generally occurs with acute rheumatism, it may result from cold, injury to the chest, — as from a kick or blow, — or arise as a complication of any severe infectious or inflammatory attack, especially pleuritis and pleuro-pneumonia.

In the first stage of the disease the affected membrane is inflamed, hot and dry, and its surfaces are no longer slippery as in health. After one or two days an unusual quantity of fluid is poured over them into the sack. If great, this effusion interferes with the action of the heart, which is also often displaced by it. The breathing is difficult and labored, and there is generally quite high fever. If the ear is then placed to the chest the heart-sounds either cannot be heard or are muffled, and appreciable only with difficulty. The pulse is soft, weak and irregular; there is frequent sighing, the lips are purplish, while in extreme cases the legs soon become dropsical. In such, also, the chest in the region of the heart may be puffed with dropsical swelling.

True dropsy of the pericardium, termed hydro-pericardium, frequently occurs with dropsical effusions elsewhere, in valvular diseases of the heart, diseases of the kidney and liver, intense anæmia, and occasionally late in severe distemper.

After the inflammation has set in, and until the effusion has taken place, the dry surfaces of the membrane constituting the sack give off a friction-sound, as they rub together with each pulsation and movement of the heart. This sound disappears as soon as the effusion forms. In dropsy of the pericardium, however, this rubbing-sound and fever are absent.

Even were it possible for a non-professional to detect with certainty the presence of pericarditis, professional assistance would be required in treatment, for in the majority of cases it is necessary to draw out the fluid by means of a trocar and canula. The former is a pointed, rod-like instrument, usually about one-fourth of an inch in diameter and some three inches in length. The canula is a thin tube which is fitted over the trocar as tightly as possible and yet be easily removable. Both are driven into the cavity to be tapped. Then the trocar is withdrawn, while the canula is left in the puncture to conduct off the fluid.

If the professional assistant be a physician who is not well up in the anatomy of the dog, it will likely be necessary to advise him that during the operation the dog should be on his feet, or at least on his forefeet, and that the point at which the trocar should be entered is generally between the seventh and eighth ribs, quite near the median line. In health the heart commonly reaches to the seventh rib, but in pericarditis it is more or less deplaced, while the sack enclosing it is distended. Therefore the place of puncture stated ought to be right. If, however, it is not so, the fact can be easily determined by percussion.

Were a mild case of pericarditis encountered, in which the effusion was not great, surgical interference might not be demanded, and medical treatment alone suffice. In such it would be necessary to paint the chest over the heart with the tincture of iodine, or apply blisters, and administer a preparation that is laxative and includes digitalis in some form; the special object being to render the kidneys and bowels more active.

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ANEURISM.

An enlargement of a part of an artery from the bursting of its inner and middle coats is termed aneurism. The outer, fibrous coat stretching, a sack is formed, in which a portion of the blood coagulates solidly. This may happen on any artery, yet the accident is very rare in dogs. In consequence of disease, the inner coats of the affected artery may become weakened, when they rupture more easily; but in most cases the cause of their giving way is a sudden and great strain, such as may occur from a fall from a considerable height, or be the result of intense effort, as a long, hard run.

Aneurism is but rarely detected during life. Its progress is slow, occupying generally several years before its fatal end; and but little can be done to stay its progress.

SECTION III.

AFFECTIONS OF THE MOUTH AND TONGUE.

CHAPTER I.

DENTITION.

IN puppies the eruption of the teeth is not attended by any of those disturbing symptoms so often noted in children. Commencing soon after birth, it goes on rapidly, and generally by the end of the first month the temporary or milk-teeth are through. These are twenty-eight in number, and consist of twelve incisors, four canines, and twelve molars, evenly divided between the jaws.

Like the first teeth of children, they are much less dense and durable than those which come later; moreover, they are smaller and sharper, and set wider apart.

The shedding of these teeth commences about the fourth month, and they may all be replaced by the permanent set in the course of a month or six weeks; but generally this final dentition ends in the sixth month, although in some instances it is not completed before the eighth month.

The permanent teeth are forty-two in number; and in the upper jaw there are six incisors, two canines, and twelve molars; while in the lower jaw there is the same number of each kind, excepting the molars, of which there are two more, or fourteen. But the number of permanent teeth may exceed forty-two; indeed, as many as eight supernumeraries have appeared irregularly in the jaws; but this is far from common, and seldom are more than one or two such found.

AFFECTIONS OF THE TEETH.

That the teeth are but a part of the one great system, and, like all organs and functions, to some extent at least, they share in the general health and infirmities, is a fact which many people fail to appreciate until pain has forced it upon them. Strangely, ere that they evidently consider these highly important parts as separable, and incapable of injury excepting when it is inflicted directly

upon them. Yet there are infinitely many influences, seemingly far removed, which may seriously affect them and cause early decay.

A healthy dog, properly cared for, should have good, sound teeth until well into the evening of life; but let him acquire a serious constitutional defect which persists, then impairment of them is certain. It is also assured if the food is not wisely chosen during puppyhood; for that which is of right quality is quite as urgently needed for good tooth-bone and enamel as for other and seemingly more important parts of the body structure. Even after maturity, if the food is for a long time deficient in certain elements, the integrity of the teeth must decline. Again, there are elements which in excess will in time produce the same result. As for instance, a dog fed much on sweets can scarcely escape indigestion, and with that trouble, some of the starch and sugar of the food must undergo acetous fermentation; and the acid resulting, finding its way into the mouth and remaining there for a time, is sure to act very unpleasantly on the tooth-enamel.

It has been customary for writers to urge that bones be given dogs frequently, that by the means of them their teeth may be kept clean; but, unfortunately, the majority have failed to emphasize the fact that bones suitable for the purpose are those only which are porous and capable of being easily crushed, while on the dense and hard, the teeth are broken or worn away, as on stones.

Such is the shape of the teeth of dogs, they are not very favorable for the lodgment of particles of food, and any that may happen to be retained between them is likely to be soon displaced by gnawing. But if allowed only soft foods, fibres of meat and vegetable substances get between the teeth, and these, undergoing partial decay, become nests, as it were, for parasites that make their home on the surfaces and in the depressions and cracks of the teeth. Likewise by degrees is formed tartar, which is largely made up of lime salts. If this deposit is allowed to accumulate it causes inflammation and softening of the gums; and extending toward the roots, the teeth in time are loosened by it.

As intimated, it is a serious mistake to give dogs hard bones, for they will persistently gnaw on them; and all the wear being on the ends of the front teeth, they must in time be worn down to a level with the gums, and more than likely some of them will be broken off.

Soft bones or others that he can crush easily, as the ribs and backbones of sheep, etc., constitute the dog's natural toothbrush, and such alone should be given him. Kept clean by them, the teeth will remain sound for many years if the general health continues good.

When tartar forms it should be removed, and this can easily be done by means of a penknife. If decay has begun its progress may be materially obstructed if thereafter the food is wisely chosen and the victim placed under good hygienic conditions. Should extraction of a tooth seem demanded, let the operation be invariably performed by a dentist.

Toothache is indicated by restlessness and irritability. The victim eats slowly,

and either rejects the hard pieces of his food or swallows them in haste without mastication. There is more or less dribbling from the corners of his mouth. He is decidedly opposed to an examination, and resists if one is attempted. Sometimes the gum around the aching tooth is swollen, or pus exudes ; but if no outward sign appears, the offender is easily located by means of a blunt piece of metal, as an ordinary key or anything of the sort. Tapping the teeth gently with this, when the right one is struck the dog will wince or struggle to break away, and likely howl with pain, while for a time afterward he will go about with his mouth open.

STOMATITIS.

Catarrhal stomatitis is an acute inflammation of the mucous membranes of the mouth, manifested by redness, heat, swelling, and at first dryness, but soon thereafter by greatly increased secretion. It may be limited to the lips and gums, or the lining of the whole mouth may be inflamed, and even the coated tongue be considerably swollen. With extensive and severe inflammation there usually appears minute blisters inside the swollen cheeks and lips, which subsequently burst and leave small superficial ulcers.

In rare instances this affection is attributable to teething. Quite often it is an accompaniment of long and exhausting fevers, digestive disorders, and throat troubles ; but generally it is caused by sharp splinters of bones, decayed teeth, or caustic poisons.

The victim of it eats slowly and carefully, and usually leaves untouched the large and hard pieces of his food ; while from the corners of his mouth there is a constant dribbling of saliva or mucus.

To effect a cure it is necessary for a time to limit the diet to liquid or very soft foods that do not require mastication. The same should also be bland and easily digestible, as milk, beef-tea, boiled rice, etc. Oftentimes half a teaspoonful of powdered sulphur, dropped between the lips and gums every two hours, reduces the inflammation very speedily ; and it should be tried. It is also advisable to swab or paint, twice daily, all inflamed parts with a solution made by adding two teaspoonfuls of the tincture of myrrh to a teacupful of water. This being non-poisonous, it can be used freely. A more potent application, which should be resorted to if simple measures have failed, is the glycerite of tannin, which should be applied twice daily with a camel's-hair brush.

Aphthous stomatitis is a variety of the catarrhal form, characterized by the eruption of vesicles or blisters upon the edge of the tongue, lips, or inside of the cheeks. These rupture in the course of a day or two, leaving aphthous ulcers, which are usually of about the size of peas, slightly raised, and surrounded by yellowish-white bases, circling each of which is a narrow red ring. In some

cases the number of ulcers is small, — only two or three, — but generally there are fifteen or twenty, or even more. Catarrhal stomatitis is associated with this form, and appears in patches which encompass the ulcers; or the lining of the whole mouth may be inflamed.

The ulcers are reluctant to heal, and rarely do so within a week; while generally they resist treatment for two or three weeks. They are evidently quite painful, and in consequence the victims must be persuaded to take food. The tongue is furred; the digestive organs as a rule are more or less disordered; constipation commonly alternates with diarrhœa; there is often slight fevers in severe cases; dribbling of saliva is constant; and the breath very offensive.

Puppies much oftener suffer from aphthous stomatitis than mature dogs; and it exhibits a very decided preference for those that are but indifferently cared for, and are therefore ill nourished and weakly.

Of the causation nothing positive is known. The trouble is generally accepted to be due directly to mechanical or chemical irritation, or possibly to poisons developed by germs; while malnutrition, teething, disorders of the organs concerned in digestion, poor blood, and impairment of the health generally, are numbered among the predisposing causes.

The blandest foods, liquid or soft, are indicated, and of them the poorly nourished should be persuaded to eat as heartily as possible. To promote healing of the ulcers, it is advisable to first very lightly touch them with stick nitrate of silver. Afterward the treatment may be the same as that advised for catarrhal stomatitis. In most cases medicines to correct digestive or other derangements will be required.

Ulcerative or fetid stomatitis is a much more serious affection than either of the forms of stomatitis just described. It is characterized by a specific ulcerative inflammation of the gums and mucous membrane of the mouth, which tends to extend widely and deeply, and is attended with a very offensive odor of the breath.

The disease starts, as a rule, at the edge of the gums opposite the lower incisor teeth, and gradually spreads backward. The gums are swollen, deeply red, painful to the touch, and bleed easily. In the course of two or three days the inflamed parts change in color and become dark purplish and greenish; there is constant oozing of blood from them, and abscesses form. These break and leave deep and ragged ulcers surrounding the necks of the teeth. This inflammation, which is gangrenous, persisting, the teeth loosen and may fall out; while in protracted cases the covering of the jaw-bone is likely to become inflamed, and necrosis or death of portions of the bone occur. There is profuse salivation, the discharge of mucus being offensive, while the breath is very foul. The tongue is heavily coated, but only in exceptional cases is it swollen; while the neighboring tissues are commonly involved by the inflammation. Hemorrhages

from the gums are frequent. Aphthous ulcers are sometimes present, and the glands of the neck, under the jaw, are generally much enlarged.

The appetite evidently continues fairly good, but comparatively little is eaten, however, owing to the difficulty in mastication and swallowing; and when food is taken, it is generally bolted in haste.

Constitutional signs, seldom absent, are those of a lowered state of vitality. The evidence of malnutrition is plain, there is loss in weight, and the coat is dry and rough. Attacks of vomiting or an offensive diarrhoea occur now and then, and they appear due to swallowing the putrid fluids of the mouth.

Ulcerative stomatitis generally attacks old dogs having badly decayed teeth, although young dogs are not exempt from the malady. Among the causes assigned are general neglect, unhygienic conditions, insufficient or unsuitable nourishment, and like influences detrimental to health. It has followed severe attacks of infectious diseases; and occurring in epidemics, that it is sometimes of microbic origin is easily believed.

In young dogs a cure may be expected under proper treatment, but in old subjects the outlook is not good, especially if there has been necrosis of the jaw-bone. Generally tonics are indicated. In all cases the food should be as nutritious as possible, also generous in quantities. To combat the offensive odor, the mouth should be swabbed with a solution of permanganate of potassium, — four grains, to water, one ounce, — or with the peroxide of hydrogen diluted with three or four parts of water. The glycerite of tannin may be wisely applied quite generously to the gums; and if the ulcerations are very reluctant to heal, it will be advisable to occasionally paint them with a solution of the nitrate of silver — ten grains, to water, one ounce. Internally the following may be given: Chlorate of potassium, two drachms; dilute hydrochloric acid, one drachm; water, four ounces. This should be administered every two hours; and in teaspoonful doses to all excepting toys, for which one-half a teaspoonful will be sufficient.

Another form of stomatitis, even more severe than the ulcerative, is the gangrenous, which is termed "canker of the mouth" by some writers on canine diseases. This sometimes starts in a swelling on the jaw, — a "gumboil," as commonly called. It may also appear first on the inside of the cheek as a nodule or "bunch." Wherever located, the swelling increases rapidly, and soon rupture occurs and there is a discharge of blood and pus having an exceedingly offensive odor. The swelling subsides somewhat, but there is left a dark, ragged and sloughing ulcer, which spreads quite rapidly, and discharges shreds of decayed tissues.

Located on the inside of the cheek, it soon "eats" its way through the same, presenting a most unhealthy wound. Considering its peculiar appearance and the most intolerable stench emitted, there is no mistaking its gangrenous character; while the general symptoms stamp it a malady of exceeding gravity.

It runs a very rapid course, and almost always to a fatal end.

The exciting cause is probably microbic.

Mercurial stomatitis sometimes occurs in dogs as a result of too large doses of calomel or other mercurials, too protracted treatment with small doses, or absorption from applications containing them. It is first of catarrhal form, and may end in that, or it may become ulcerative stomatitis; this, however, is but very rarely the result.

SWOLLEN GUMS.

In occasional instances the gums are swollen, soft, spongy, sensitive, and disposed to bleed easily. A like condition in man indicates scurvy, and in the dog it is evidence that the general health is much below the normal; also, as a rule, that he is not properly fed or otherwise rightly cared for.

In such cases the breath is usually offensive, in consequence of digestive disturbances, and especially that rather vague condition commonly known as biliousness. There is also a change in demeanor, the victims being rather dull and listless, if not obstinate and sulky, while the appetite is poor.

The trouble is but rarely encountered except in house-pets, fed unwisely and to excess, and deprived of sufficient exercise. In this fact appears the essentials in the way of treatment. It should begin with a generous cathartic, as magnesia or the syrup of buckthorn. For several days afterward the diet should be of the starvation sort; that is, but little food and only at long intervals.

Two meals daily will be ample, and the first may rightly consist of new milk or butter-milk—the latter for choice; while for the heartiest meal of the day—at night—lean meat, either raw or cooked, chopped fine, and in quantity about one-fourth the proportion of other foods would be right. As for the other ingredients, they should be rice, Graham bread or crackers, and vegetables that grow above ground, if they can be obtained, as the various “greens,” cabbage, etc.

Exercise should be strictly enforced, the dog being obliged to walk a mile each day at first, then two miles, and so on until in condition for good long runs behind a horse. Of course, as he becomes stronger his food may be more generous, and the proportion of meat considerably increased.

Unless there are accumulations of tartar, which must be removed, local treatment will scarcely be required; yet it can do no harm, and may do some good, to rub the gums each day with tincture of myrrh. The remonstrance against the use of this will be, however, very energetic after the first application.

WARTS ON THE LIPS.

Growths having the appearance and of the nature of warts frequently appear on the lips, and extend even to the gums. They are of various sizes, and tend to unite in groups. When in large numbers, usually a fetid odor is emitted. They bleed easily, and once wounded, the bleeding quite obstinately persists.

Small warts, standing alone, can be safely removed by snipping with scissors; but in consequence of the bleeding tendency, it is generally necessary to lightly touch the stumps or wounds left with the nitrate of silver. Large growths had best be ligatured with silk or fine elastic cord; the ligature being tightly tied at the base, that it may cut its way through and the excrescences fall off. When in groups, two or three of the growths forming the same could be cut off each day, until all were removed; or they might be burned with caustic potassa or carbolic acid of full strength; the latter being usually the safest in the hands of the inexperienced, who should apply the acid in minute quantity by means of a sharpened pine stick or very small camel's-hair brush. Another and even better method of treatment where the growths are of considerable size or in groups is to apply the following: Salicylic acid, one-half a drachm; alcohol, one-half a drachm; sulphuric ether, one-half a drachm; collodion, two and one-half drachms.

By pressure with a soft cloth the growths should be first thoroughly dried, and then painted with this preparation, a small camel's-hair brush being used. The applications should be made twice daily, and the mouth be kept open, with the lips apart, for several minutes, — until the "paint" is dry. Afterwards, over the parts treated, dry powdered sulphur should be freely dusted.

Under this treatment, in the course of three or four days, the vitality of the excrescences ought to be destroyed; and it should then be possible to pick them off, or easily pare them away with a knife.

If the growths return, the following should be given internally: Precipitated sulphur, two drachms; solution of arseniate of sodium, one and one-half drachms; mucilage, one and one-half ounces; water, sufficient to make six ounces. Shake well. Dose: Two teaspoonfuls, morning and night, to dog of medium size; three teaspoonfuls to largest breeds; one teaspoonful to fox-terriers and the like; and one-half a teaspoonful to toys.

GLOSSITIS.

Acute glossitis is an acute parenchymatous inflammation of the tongue, which comes on suddenly, usually with much severity and danger, and occasionally ends in abscess. The swelling is rapid; and although in some cases it is not

very great, generally in the course of a few hours the tongue is double its natural size, if not swollen sufficiently to threaten suffocation. Of deep red color and glistening at first, ere long it becomes purplish, and in time its covering is likely cracked and ulcerated. The lining membrane of the mouth shares in the inflammation, during the first stages of which it is very dry, and consequently the suffering greatly intensified; but soon the salivary glands begin to pour out their secretion in generous quantities; and indeed, the salivation may be so profuse that swallowing and even breathing are rendered difficult and distressing.

The inflammation may reach its height in the course of three or four days and the swelling begin to subside, in which event it will have generally all disappeared by the end of a week; or suppuration may occur and abscesses form. These are usually located in the lower part of the tongue; and owing to its peculiar structure, they are never clearly defined, and except the persisting swelling, often there is no indication of their presence up to the time that they burst and discharge.

Acute glossitis is generally caused by the stings or bites of insects, by wounds on the tongue produced by sharp slivers of bone, or by the action of corrosives. It is reasonable to assume that it may follow even slight injuries and lacerations of the tongue if through the latter there happen to be introduced inflammatory poisons or microbes.

Where the swelling is great and consequently swallowing is difficult, it will generally be necessary to employ a rubber tube in feeding and administering medicines, the same being passed in over the tongue and down into the gullet. By this means, if not possible in the ordinary way, a brisk purge should be given as soon as the nature of the attack is evident. The mouth should then be constantly drenched with ice-water for several hours at least; and it would be advisable always to persist in this treatment if possible until the swelling begins to subside.

If the suffering be very great or suffocation threatened, blood must be drawn from the tongue, the services of a professional being sought, who should be advised to "stab" it in several places with a knife having quite a narrow blade, if deep scarifications do not appear necessary.

The swelling on the wane, the only treatment required will probably be the use of some soothing mouth-wash, as borax and water.

Abscesses are serious complications. They should be opened early and washed out with some antiseptic solution.

Milk and raw eggs must be mainly relied upon in feeding.

The tongue is sometimes bitten during an attack of convulsions. Such injuries and others of comparatively trifling character scarcely require treatment if inflammation does not set in, because repair goes on quickly in the mouth, but it may be advisable to paint the wounds a few times with the compound tincture of benzoin.

Very rarely indeed does the tongue suffer from chronic inflammation or glossitis, and in nearly all, if not quite all, cases of it, the trouble is largely or wholly the consequence of inability to close the mouth, as after fracture of the jaw and faulty adjustment of the broken ends of the bone. The tongue is then habitually quite dry, and its surface somewhat uneven and furrowed. There are on it also, between the furrows, patches of various size that are smooth and shiny.

PARALYSIS OF THE TONGUE.

Paralysis of the tongue without loss of power elsewhere is rare; but since it occurs, attention should be drawn to it, because when of considerable extent its innocent victims present really the most prominent sign of dumb rabies. Moreover, the impairment is very depressing, and perverting the disposition of unfortunates, it generally causes them in time to become dispirited, dull and sullen. Thus they are made to even more closely resemble sufferers from rabies. With only one-half of the tongue paralyzed, as is sometimes the case, it is carried to one side; but the loss being bilateral, — that is, on both sides, — it is always protruding; and, constantly exposed to the air, it becomes dry and hard, also accumulates dirt, stray bits of wood, straw, etc.

As a rule, the paralysis is due to some local change in structure, hence a cure is impossible; and the outlook is equally unfavorable if it has existed more than a month and a gain under treatment has not taken place, for then the integrity of the affected muscles or nerves has become permanently injured.

The only remedy which promises well is strychnia; yet rarely will that even have any notable effect.

BLAIN.

Blain is an acute affection of the tongue which is quite closely identified with, but not wholly confined to, horses and cattle, for now and then, but not often, it occurs in dogs. It is characterized by quite a severe inflammation of the tongue and an eruption of blisters on its sides and under surface. The blisters, or properly vesicles, which are bright red in color, remain as such for several days, then rupture and ulcers form in their places. These enlarge, tend to become indolent, or even gangrenous; and in time they discharge a purulent bloody matter that has a peculiar and very disagreeable odor. The flow of saliva and mucus is profuse. In some instances the tissues forming the floor of the mouth are involved and abscesses form there. Often also the glands of the neck are enlarged and painful.

This affection has generally been attributed to improper feeding, neglect, exposure, and like influences; but there are good grounds for the belief that the real cause in some, if not all, cases is a micro-organism; since the disease exhibits a decided preference for certain seasons of the year and occurs in epidemics.

The treatment must be largely local, and powders are preferable to fluids as applications, for the reason that they remain longer in the mouth. Dry powdered sulphur, mixed with an equal quantity of white sugar, acts well, and half a teaspoonful of it can wisely be thrown well back under the tongue, three or four times daily, after the mouth has been cleaned by sponging. Borax is another serviceable remedy when mixed with four times its quantity of white sugar, and a "pinch" of goodly size could be dropped onto the sides of the tongue every half hour or hour.

Should these simple measures prove ineffective, it will be advisable to seek the aid of a physician, who will rightly first "swab" the ulcers with a solution of cocaine, and then cauterize them. After which either of the powders mentioned may be used as before.

Four or five days having passed without improvement, the cocaine and caustic should be again tried.

Internal remedies addressed directly to the local trouble are rarely necessary, but if indicated, the mixture of chlorate of potassium recommended in Ulcerative Stomatitis may be administered.

Considering the reluctance to take food in sufficient quantity, owing to the pain produced, it should be as concentrated and highly nourishing as possible, also given at shorter intervals than usual; while if the general health be impaired, tonics must of course be resorted to.

CHAPTER II.

PAROTITIS.

THE parotid glands are situated one on each side of the neck below the ear. Inflammation of them is rare excepting in cases in which they have been injured, as by a severe blow or kick; but sometimes they are the seat of an acute inflammation which presents many of the characteristics of mumps in man, including the indications of microbic origin.

When attacked by inflammation, these glands, which in health can neither be seen nor felt, swell rapidly and become very painful. Soon they are much enlarged, while other glands of the neck are also generally more or less swollen sympathetically, and the shape of the stiffened neck is greatly changed. The head would seem to have grown much heavier, for it hangs low, and but rarely are attempts made to raise it. There is usually some but not high fever. Only little is eaten, evidently because of the difficulty in swallowing, and of solids all large pieces of food are rejected. The other salivary glands are usually involved in the inflammation, and the secretions increased; but instead of being thin, as in ordinary salivation, the discharge from the mouth is thick and ropy.

The duration of the disease is commonly about one week, after which, if complications do not occur, the swelling begins to subside, and has generally entirely disappeared before the end of the second week. But in some instances, instead of such favorable result, an abscess is formed in the gland, which runs the usual course, and finally ruptures if not interfered with. By this complication recovery is of course delayed and the suffering intensified, for the adjacent tissues share in the inflammation.

It is advisable always to administer a purge early in the attack.

To keep the patient quiet, in a comfortably heated and well-ventilated room, support him with bland liquid foods, and bathe his neck either with warm applications or some simple liniment, as soap liniment, is about all that is required in uncomplicated cases.

If an abscess forms it should be opened by an knife when the right time comes; and since all incisions in its locality tend to heal very quickly, it is generally advisable to insert a drainage-tube to keep the cut open.

If abscesses form in any other of the swollen salivary glands they should be treated in like manner.

RANULA.

Tumors of various kinds may be found in the mouths of dogs, but the commonest are the so-called encysted tumors, containing a thick, glairy liquid. They may form on the inner surface of the lips, but usually exist in the lower part of the mouth, under the tongue, where they are called ranula. When not disturbed by treatment they may reach considerable size and displace the tongue. They then interfere with swallowing, and even respiration. Their contents change in time, and become thick and cheese-like, or quite hard and dense.

If these cysts cannot be entirely extirpated, which is best always, at least their contents and as much of their walls as possible should be removed. Another process of treatment which may prove effectual is to make in them large openings, evacuate their contents, and then inject into the sacks the tincture of iodine or a strong solution of one of the caustics, and thus cause them to shrivel, and their walls to unite.

OBSTRUCTION OF THE ŒSOPHAGUS.

The pharynx is the upper part of what is sometimes termed the "swallowing throat," or passage from the mouth to the stomach, while the other and lower part is the Œsophagus. Together they constitute the so-called gullet. This tube or passage is sometimes narrowed by abscesses, enlarged glands, polypi, or other tumors pressing upon it; but in most instances in which it is obstructed it is by foreign bodies, and generally splinters of bones, fish-bones, or large pieces of meat, although attempts to swallow small stones, pieces of glass, and bits of wood are often made; while now and then corks, needles, buttons, and various other domestic articles find their way into the food when the same consists largely of waste and scraps from the table.

When anything has stuck in the throat, as a rule, a sense of choking and fits of suffocative cough are produced; while if the substance is lodged lower down, the victim moves about restlessly, with his head and neck extended, and paws frequently at his neck over the place at which the trouble is located. Very generally foreign bodies in the pharynx are rapidly coated with mucus, and either soon dislodged and expelled during fits of "gagging" or vomiting, or they settle down a short distance into the Œsophagus. The urgent signs of choking then subside; but the unfortunate is still very restless, and if the offending substance is large, he refuses to attempt to eat or drink.

The lining of the throat is speedily inflamed by an obstructing body, and ulceration soon follows. Its removal is then more difficult; while in conse-

quence of the distress, deprivation of food and drink, etc., general depression and weakness are steadily increasing.

Anything in the throat can usually be felt inside or on the outside; obstructions can also generally be made out in the neck, unless they are quite low down in the passage and near the stomach.

He who examines the inside of the throat should do so cautiously, lest he push the troublesome substance deeper into the passage; whereas not being firmly fixed, it might have been possible to easily remove it by way of the mouth. If, however, it be a large piece of meat or something equally as soft, or it cannot be reached and pulled out, it should be, if possible, pushed downward into the stomach.

When it is found impossible to dislodge a foreign body upwards by means of the fingers or forceps, it is generally advisable to produce violent vomiting; and if an emetic cannot be administered, a dose of apomorphia might be given subcutaneously, as recommended in cases of poisoning.

Vomiting being ineffectual, and satisfied that its removal upwards is not possible, efforts should be made to push the obstruction downward into the stomach. For this purpose the best means for a layman to employ is a flexible catheter or piece of rubber tubing of about the same diameter; for with it no harm can be done, whereas to use anything stiffer might be dangerous. While passing it, the mouth should be held wide open and the head extended. The instrument, having first been well lubricated with fresh lard, vaselin, or sweet oil, while being introduced should be kept against the roof of the mouth and back wall of the throat, that it may clear the larynx, which lies in front. The obstruction reached, if a tube is employed, it will be advisable to pass down through it a small quantity of sweet oil; and then firm pressure should be kept up until the substance yields, or the fact is clear that it is too firmly impacted to be moved.

When an obstruction can neither be dislodged upward nor downward, nothing remains but the operation known as œsophagotomy; which consists of cutting through the neck directly over the foreign body, and removing it by way of the incision. To a surgeon this would prove a very easy operation. He would not get union by first intention, therefore it would be useless to try for it; and it were best to keep the outer wound open for about a day. The patient should be deprived of food for at least forty hours.

PHARYNGITIS.

Only rarely is the pharynx the seat of disease, and then very generally the trouble is inflammation of the mucous membrane that lines it, known as pharyngitis. This affection is quite invariably of acute character; it is also in most

cases an extension of inflammation in the mouth, nasal passages, or larynx, behind which the pharynx is located. Occurring alone, as an individual affection, it is commonly caused by some foreign body, as a sharp splinter of bone. A part of an inflammation elsewhere, the usual causes are those which give rise to the associated coryza, stomatitis, laryngitis, etc. The symptoms excited by anything unusual in the throat have been described in the discussion of obstructions of the oesophagus. If a substance is lodged there, and especially if the same is sharp and cutting, the lining membrane is soon congested; and then, although the most urgent of the symptoms disappear on its removal, some usually linger for a short time; and those remaining may be quite severe enough to justify the fear that the offending body has not been dislodged. But having really been so, the inflammation produced by it will likely have all subsided in the course of two or three days.

In pharyngitis without obstruction, and the attack severe, there is generally frequent hawking, drooling at the corners of the mouth, possibly a peculiar throat cough, enlargement of the glands of the neck, and difficulty in swallowing. The last mentioned, however, and a careful avoidance of large pieces of food, especially the hard, are sometimes the only notable signs. Further evidence of the throat trouble can then, usually, be developed by firmly pressing the neck immediately under the jaw; when if there is much inflammation within, the patient shrinks as though in pain, and for a moment coughs hoarsely.

On examination of the throat, its lining appears brighter red than normal, and coated here and there with small yellowish-white clots. Excepting in mild cases, the throat seems narrowed because of the swelling, which, as a rule, affects the tonsils, and causes them to stand out quite prominently.

In diphtheria the false membrane generally forms in some part of the pharynx; and when in sight there is but little danger of mistaking its identity.

Between the throat and adjacent parts and the stomach there exists such a decided sympathy that in case the former becomes inflamed the latter is similarly affected or much disordered.

Excepting there be an obstruction in the throat, when of course the same ought to be removed as soon as possible, only rarely will treatment be demanded in pharyngitis, so speedy is its natural tendency to recovery; but now and then the inflammation is so severe, hot applications to the front of the throat are necessary. After a faithful use of them for ten or fifteen minutes, it will be well to rub onto the neck either camphor or soap liniments, and swathe it with flannel or cotton wadding. If the inflammation within is very severe and the throat much swollen, all affected parts inside should be carefully painted, every two or three hours, with a mixture of chloral hydrate five grains, and glycerin one ounce.

No internal treatment will likely be required.

In all cases it is advisable to restrict the diet to warm liquids, as milk and broths, containing well-soaked bread.

Sometimes, but only very rarely, abscesses form in the back part of the pharynx. Their presence may be suspected if pharyngitis has existed for several days, and the patient carries his head extended, fixed and immovable on his neck.

Before leaving this subject, attention can properly be called to the fact that the first signs of trouble manifested by some rabid dogs are symptoms identical with those which would be produced by a fish-bone or other foreign body in the throat. Therefore when a strange dog acts as though something had stuck there, he should be handled carefully, and gloves ought to be worn during the examination.

SECTION IV.

DISEASES OF THE DIGESTIVE SYSTEM.

CHAPTER I.

DIGESTION.

NICETY of expression would likely invite confusion, and indeed it is quite sufficient to say that the lean portions of meat are very largely digested in the stomach. This process does not, however, go on as rapidly in the dog as in man; and while in the latter it would ordinarily be completed in the course of three or four hours, in the former the end would scarcely be reached before the eleventh or twelfth hour.

The starchy elements of vegetables do not have, to any degree worth mentioning, the helpful influence of the saliva towards their digestion, nor is the stomach much, if any, concerned in the process; and soon after they reach it they begin to pass downward into the intestines, where they are converted into sugar by its fluids, and at once absorbed. Pure starch itself is rapidly digested. Indeed, under experiment it has been found that three-quarters of an hour after a moderately full meal of boiled starch and meat, all traces of the starch and sugar had disappeared from both the stomach and intestines. The conversion of some starchy foods, however, seems to be quite slow. For example, potatoes, when well cooked and mashed, disappear in the course of two or three hours, but if not broken up they remain five or six hours. The digestion of boiled rice commences at once, but its conversion is slow, and traces of it can generally be found even at the seventh or eighth hour. Although milk is considered one of the most easily digestible of foods, as a matter of fact its digestion is comparatively a slow process.

The fats or oily matters in foods are not digested in the stomach, but, melted by its warmth and the tissues containing them being partially broken up and digested by the gastric juice, they pass into the intestines, where the oil globules are freed, and then emulsified; or, in other words, they are minutely subdivided, so that they are capable of being absorbed. This, practically, is the extent of their digestion.

As stated in substance, when the food is meat, stomach digestion, if normal,

generally occupies eleven or twelve hours ; and within this period an ordinary meal of lean beef, cut in small pieces, should be nearly all, if not quite all, disposed of. Were the meal unusually large, however, digestion would be slower, and possibly not entirely completed before the fourteenth or fifteenth hour. Again, the length of time digestion requires depends much upon the kind of meat. For example, pork is notoriously hard to digest, and but slowly yields to the process ; while tripe is easy, and soon disposed of.

Normal digestion is not attended by any disturbing sensations attributable thereto. Indeed, on the contrary, after a full meal, feelings of comfort and contentment are plainly evident. But when the health is not good, or there suddenly occurs some disturbing and depressing influence, digestion is retarded or altogether arrested, and the contents of the stomach excite irritation of its walls, and cause a sense of weight and discomfort.

If stomach digestion is stopped or is going on too slowly, the foods retained undergo fermentation, decomposition takes place, harmful acids and gases are formed, and the victim suffers from "bloating" and an increase of all the disturbing sensations previously felt. Frequently vomiting occurs and the stomach is emptied ; but generally its contents pass downward, still undigested, into the intestines.

Even where digestion is normal, not all the meat taken into the stomach is digested therein. Small portions of it enter the intestines, where the gastric juice, which goes with them, continues to act for a time, and the intestinal fluids practically finish the work. But while the digestion of meat fibres extends into the intestines, beyond the stomach it is anything but vigorous, and in fact it is comparatively weak, and only very small quantities can then be disposed of after that organ has been left.

Now let the undigested portions of food be in considerable quantity, as always where stomach digestion has been delayed or altogether arrested, they must prove too much for the intestinal fluids, and act on the intestinal walls as they did on the walls of the stomach, and irritate them — also give rise to a feeling of discomfort if not actual pain. The intestines in turn, revolting against the imposition, endeavor to get rid of the disturbing elements ; and diarrhoea is the natural means employed if there are many of them.

The stomach may do its work promptly and well and yet the intestines be at fault ; in which instance their contents undergo fermentation and decomposition, and unnatural fluids and gases are generated, as in the stomach when it is inactive or sluggish. These cause distension of the bowels ; they also give rise to colic and diarrhoea, through the irritation that they excite.

Obviously, therefore, digestive trouble may be in the stomach or in the intestines ; or in other words, there may be gastric or intestinal indigestion. It is not often wholly confined to either ; and while there might possibly be intestinal disorder without the stomach being involved, the intestines never fail to share in

serious gastric affections. It is an evident fact also that a disturbance of digestion may occur suddenly, exist but for a few days and then be recovered from, or it may persist for weeks, months, or even years. Varying the expression, indigestion may be acute or chronic ; and since these forms have special features, it is deemed best to recognize this distinction, and consider them under separate heads.

VOMITING.

Vomiting is a symptom of many affections, among which are indigestion, colic, inflammation or other disease of the stomach, diarrhoea, dysentery, worms, obstruction of the bowels, and irritant poisoning ; and as such it has been duly considered, and appropriate treatment recommended under the various heads. But contrary to the rule in mankind, in accordance with which vomiting is rare except there be considerable disturbance somewhere in the system, in dogs it may occur at will. For instance, when puppies have reached the third or fourth week, oftentimes their mother tires of nursing, or feels that her breasts do not furnish sufficient support. She will then, if fed away from them, fill her stomach, and as soon as opportunity presents, unload its contents before them. And others who have been mothers are likely to do this where they have access to a litter and think it high time that the pups be weaned.

Vomiting may, therefore, mean much or merely nothing, and usually the latter, if it occurs after a hearty meal, in which case the food is generally first bolted, then thrown up and eaten leisurely. At other times, however, it is generally of more importance, although not necessarily so if it occurs only now and then ; but several attacks following one another at brief intervals are indicative that the vomiting is a symptom, and there is some disease present or threatened.

When mucus only is expelled by the act it may come from the air-passages, but generally it is from the stomach, and suggests trouble there. Streaks of blood may appear in the matter raised if vomiting is quite persistent and there has been much straining, but in such case they are not important. When, however, there is much blood of a bright red color and in considerable quantity, the cause is likely a sharp bone lodged in the gullet. Blood having the appearance of coffee-grounds comes from the stomach, and suggests an ulcer of the same, which, however, is of an exceedingly rare occurrence in dogs.

While attacks of vomiting are persistent, the lower opening of the stomach is relaxed and open, consequently the contents of the intestine adjoining are admitted ; and since it is near there that the bile pours out of the gall-duct, more or less of it naturally finds its way into the stomach. The ejected matter is then of greenish color, and the same appearing, it is customary to blame the liver and attribute the vomiting to the bile ; whereas the expulsion of the latter is purely

a mechanical effect, the bile being sucked up into the stomach by the act of vomiting.

When purely functional, that is, when it occurs independently of disease, vomiting does not require any treatment. In cases in which no other symptoms are present and the cause cannot be made out, food should be for a time withheld or restricted to milk and lime-water. If then it does not cease and doubts still exist, it may be treated as advised in diarrhœa.

ACUTE INDIGESTION.

It need not be urged that the digestion of dogs in health is very powerful, and that the stomach and intestines are in a rare degree insensible to such impositions as bones, small stones, bits of wood, etc., which in most other animals would be quite certain to excite irritation if not severe trouble. But all members of the canine race are not healthy, and as a matter of fact such are their conditions generally, — the feeding being often unwise, the kennelling faulty, and the amount of exercise insufficient, — they may be said to be at the present time quite far removed from nature, and in considerable degree lacking the high health of their ancestors. While this is true of dogs as a whole, it would be too much to affirm that all have declined greatly from the original standard. Indeed, it is by no means certain that domestication has not been charged with greater loss in this direction than rightfully belongs to it ; and although there must have been some deterioration of course, there are still many dogs quite as healthy, strong and enduring as were their relatives in the wild state.

Leaving speculation and fairly entering the subject at hand, the fact is encountered that the functions of digestion are quite frequently disturbed. In truth, there are but few diseases affecting the body generally which do not interfere with them. It is not, however, the purpose to treat here of derangements of digestion which are mere complications and occur through sympathy, as it were, of the stomach and associate organs with troubles in other organs or parts, but, instead, it is to deal with derangements which result from immediate or direct inflictions, as by feeding unwisely, etc.

When digestion is greatly retarded or stopped altogether for a time, as it may be by a hard run, swim, or chill from sudden exposure to cold, an attack of acute indigestion is likely the result, but in most cases of that trouble the cause is over-feeding. Fortunately it is then chiefly limited to disturbance of the digestive organs, and does not materially affect the general system or health. Furthermore, unless of too frequent recurrence, it is usually of temporary duration merely. Dogs have the happy faculty of vomiting easily, and by that means they are generally able to relieve an over-loaded stomach. They lack discretion, however, and are

quite sure to over-indulge again and again if permitted to do so, and consequently keep their stomachs worried and unsettled, until at last there is quite serious derangement of them.

In man only one gluttonous indulgence might be sufficient to produce acute indigestion, but several such would doubtless be required by the ordinary dog, assuming that the foods taken were fairly wholesome and easily digestible; and the trouble fixed in him, the lining membrane of his stomach and a portion at least of his intestines are irritated, his appetite is impaired, and likely there is notable weakness and trembling. Vomiting or attempts to vomit may be made occasionally. If soon after eating and much is raised, it is generally undigested food. Vomiting may occur after drinking water merely, and then the same is returned bubbling and thickened by mucus. In severe cases of indigestion there is usually bloating, in consequence of gas in the stomach or intestines. The nose is hot and dry. The victim is irritable, and disposed to shun companionship and seek retired places. Often his tongue has a thick, whitish coat, and his breath is highly offensive, which symptoms generally lead to the conclusion that this attack is one of biliousness. As for his bowels, usually at first they are constipated, but after a time, if the trouble is severe, diarrhoea sets in, and persists until the offending substances have been carried out of the system.

Acute indigestion, merely — that is, the victim otherwise well — frequently requires only rest for the stomach, consequently the treatment should be of the starvation sort. A complete fast of from one to three days can do no harm, and is really advisable if the subject be fairly strong; but the caretaker declining to institute it under the mistaken notion that it is cruel, milk and lime-water, or skimmed milk, or butter-milk might be given in small quantities every four or five hours.

If the bowels are not too active, it is well to stimulate them by means of a laxative. Since in indigestion there is usually an excess of acids in the alimentary canal, an antacid is the best to use; and of all such agents, there are none to be preferred to calcined magnesia, because it acts well, and has almost no taste, consequently can be given in milk. The right dose is a full tablespoonful; but this is not a powerful cathartic, and were it desirable to have the bowels move very freely, as when they are sluggish and the breath is highly offensive, about one-half a teaspoonful of powdered rhubarb should be added to the quantity of magnesia advised. Or if the bowels move none too often, and there is considerable "bloating" after eating, worm medicine having been given without materially affecting the trouble, instead of magnesia alone it may be well to give the following mixture for a week or more, in teaspoonful doses, mixed with the food, once or twice daily: Magnesia, calcium phosphate, powdered charcoal, and sulphur, in equal parts.

The fact should be kept in sight that in acute indigestion there is refuse of undigested or half-digested food in the intestines, if not in the stomach — unless

of course the bowels have moved freely; and sufficient of the same to keep up an irritation may be retained even if there has been a brief period of diarrhœa. A dose of magnesia alone or even combined with rhubarb can scarcely do harm in any case, therefore, when the caretaker is in doubt whether or not a laxative is required, he will do well to assume the affirmative and give one.

The bowels having been freed and the stomach allowed sufficient rest, the disturbing symptoms will speedily disappear if the trouble is merely acute indigestion. The diet may then be more generous, but for several days at least the foods should be bland and easily digestible. It will scarcely ever be necessary to attempt to stimulate the appetite, for unless there is some trouble beyond the digestive organs, it will improve as they become better able to dispose of food.

CHRONIC INDIGESTION.

This term is scarcely appropriate, and dyspepsia — which means difficult digestion — would be better, yet it is pardonable after the use of acute indigestion; nor can it invite confusion, since non-professionals fully appreciate its real significance.

Indigestion may have existed for several months without permanent change occurring in the stomach; yet if it has persisted for a long time, the walls of that organ are likely thinned, its lining membrane is more or less atrophied or wasted, and many of its tubules or follicles — structures which play such an important part in digestion — are shrunken and degenerated. These changes having taken place, the other organs intimately associated with the stomach, as the liver and intestines, are in corresponding degree enfeebled.

The number of agencies which are capable of causing chronic indigestion in man are many and varied; but such are the peculiarities of his digestive apparatus and constitution generally, the dog is able to successfully resist no small proportion of like agencies, and in him the trouble is usually produced by improper diet, under which head may be included food that in the first instance is unsuitable or rendered so in cooking, the habit of eating too much, or of eating only fairly moderately but at too short intervals or irregularly — as is the common fault with house pets. Bad water can also be assigned as a cause. Another is found in the irritants which man uses as condiments; namely, pungent spices, vinegar, and the like, which, while often injuriously affecting his own digestive processes, are a much more serious infliction on his dog, and especially if he be of delicately constituted breed.

These are the common causes, but there are others that act indirectly; and while alone they might not be capable of producing the affection under consideration, they yet pave the way, as it were, and make its occurrence easy. One of the

most potent of these is deficient exercise; and when combined with the habit of giving too much food, even if the same be wholesome, digestion must soon be disturbed, and eventually weakened beyond repair. For instance, dogs constantly afield often with impunity gorge themselves after hard days' runs, but were others kept in kennels to do likewise their stomachs would soon rebel.

While digestion is going on vigorously the energies of the system are, for the time being, largely diverted to the organs concerned in the operation, consequently the subject should rest; and if a dog, the period should not be less than four or five hours, provided the meal is a full one and largely made up of meat. The natural inference from this is that habitual hard work after eating is in time sure to cause permanent gastric derangement.

That tendencies to digestive weaknesses are transmitted from parent to offspring is a fact beyond dispute, and clearly suggests the importance of instituting every precaution to prevent their being acquired by breeding animals. Nor must these animals in any other way be enfeebled nor their blood disordered; for like conditions will generally appear in their young, and in consequence the digestion of the latter never be vigorous.

In mankind, in a large proportion of cases, dyspepsia originates and is perpetuated in mental causes. Fortunately for the dog he is far less sensible of them, and yet very evidently he does not escape them altogether, for his digestion is only at its best when he is happy and contented; and it is well to add that he can never be perfectly so when chained or otherwise injudiciously restrained. Finally, this affection is frequently one of the penalties of old age, the entire digestive system sharing in the general decline in physical powers; but even in this class of cases it can be long delayed by wise management, or its coming may be hastened by influences that lower the vitality, as bad hygienic surroundings, doubtful methods of feeding, indolent habits, etc.

Glancing at the symptoms of chronic indigestion, the appetite first presents itself. It is very evidently abnormal, and may be either increased, diminished, or perverted; and these changes may alternate in the same individuals. As a rule, however, increase and perversion are much the most common. Where the former is the case, many of the subjects keep well up in weight, and indeed they are generally obese, but in such cases the indigestion is usually of low type. On the other hand, when it is severe, while in occasional instances the weight may still be excessive, nutrition commonly suffers, and there is generally considerable falling off, which may extend even to emaciation. As for perversion of the appetite, that is manifested by strong cravings for certain refuse substances which would scarcely be touched by dogs were they well fed and their stomachs in good condition.

An aversion to all nourishment is noted now and then, but it usually lasts only for a day or two after the digestive trouble has been aggravated by some unusual and especially trying indulgence. The appetite returning, it may soon

be excessive, although in some cases it remains poor and the subjects are "dainty feeders."

From the change in demeanor it is easy to believe that dogs troubled with indigestion suffer from much the same uncomfortable sensations as their masters when similarly affected. That there is lassitude is evident, for the movements are indolent. Depression of spirits is also apparent, and excepting where the victims are of remarkably amiable dispositions, the tempers are decidedly irritable.

Vomiting is a symptom of chronic indigestion, but by no means a common one excepting in the earlier stages, while as yet there is no decided thinning of its walls or dilation of the stomach. When, however, these changes have commenced, the expulsive power has begun to decline; and it lessens as they progress, until the peculiarity of being able to vomit easily is lost. When they are well advanced, even under powerful emetics the stomach finds it difficult to empty itself.

It is a well-known fact that victims of chronic affections have occasional periods during which their troubles lighten, while at other times they are intensified, and in this respect indigestion is no exception. For days and even weeks it may be only of mild intensity, then it is aggravated, the symptoms are all more pronounced, and likely new ones are added. Among the latter a foul breath is the most notable and of the greatest significance. Indeed, when it is present with the signs already described, there can be no mistaking the fact that the stomach is seriously at fault.

Beyond these symptoms others are occasionally manifested in chronic indigestion. One appears in the tongue, which is thickly coated. There is also constipation at intervals, and this may alternate with diarrhoea. Still another symptom that is observed now and then, especially in house pets, is temporary impairment of the hearing power.

As already intimated, the vigor and nutrition of some victims of chronic indigestion are not materially altered, and they may even be much over-weight, in which instances this trouble is likely to escape detection; in others, however, the impairment is great, there is a falling off in flesh, the skin loses much of its natural smoothness and elasticity, and the victim is "hidebound," while its hair parts with its gloss and becomes dry and staring.

This disease is never fatal, but others, and especially eczema, follow in its course, while alone it is likely, by impairing nutrition, to cause enfeeblement of the entire system, and so indirectly shorten life.

If treatment is judiciously applied before the changes in the structure of the stomach previously described have occurred, this ailment is curable; and even in advanced cases very decided improvement is possible under proper conditions. If it is due to specific causes it will be necessary to remove them, while if part of an enfeebled physical state, the associated troubles must, of course, be remedied.

Since by far the most common cause of the affection is in the feeding, also in every case that must be right in order to effect a cure, the dietetic treatment may properly first engage attention.

Much has been said and written about the harmful effects of over-feeding, and beyond doubt this fault is very prevalent, yet the fact must not go out of sight that under-feeding may be even more disastrous. In most cases of indigestion from over-feeding the trouble for a long time is limited to disturbance of the digestive organs. When, on the other hand, dogs become habituated to too scanty a diet, no matter how well digestion may be performed at first, it must ultimately suffer, because the blood is largely lacking the materials out of which the digestive fluids are formed; and at the same time it is unable to provide in proper quantities the elements required for the growth and support of the body. However, but few owners are likely to fall into this error, and a passing allusion to it will suffice.

Dogs are eminently capable of digesting vegetables and starches; and these are suitable foods when properly combined with meats, but if given habitually to excess they are sure, in time, to impair the digestive organs and general health, and thus open the door to disease. The reason is obvious. Those foods are poor in nutritive elements, and fed on them alone, dogs must overload their stomachs in order to have sufficient in the way of materials for growth and repair. Again, they pass quickly down and out of the stomach, and if properly cooked are digested in the course of a few hours. Now, assuming that a dog is allowed these substances only, and fed but once, or twice even, daily, manifestly his empty stomach must crave food long before it is given him, and be weakened by the deprivation.

It follows, therefore, that in giving a mixed diet in chronic indigestion great care will be necessary in estimating the right proportions of the various ingredients; and it will be found as a rule that more meat and less in the way of starches will best meet the existing conditions. Indeed, experience has taught that a diet consisting solely of raw meat that has been finely minced, in much the largest proportion of cases is superior to any other.

This diet relied on, two meals daily should be sufficient, although a few swallows of milk at noon can do no harm and the stomach may be better for the habit. The quantity of food required will be about one pound and one-half for the largest dogs, and one pound for the middle-weights; while for the smaller breeds it should be in corresponding proportion.

If the meat is properly digested, the patient's strength and spirits keep up, and other signs indicate that he is doing well, its use should be persisted in until he is back to his old form; and no other internal measure of treatment will likely be required. But while a purely meat diet usually acts well, in some cases it is productive of looseness of the bowels, if not of diarrhoea; in which event the caretaker should obtain saccharated pepsin and subnitrate of bismuth,

of each half an ounce, and sprinkle about half a teaspoonful of the mixture over the meat at each feeding.

A purely meat diet under ordinary conditions has penalties, and were it given a healthy dog continuously, possibly his blood would become what might without impropriety be called inflammable, and he have "breakings out" in the form of pimples, pustules, or "raw" patches. But this accident is not likely to occur if the health is much impaired, and especially if there is chronic indigestion. In truth, a diet made up largely of meat is, as a rule, one of the first essentials in cases of non-contagious skin diseases of long standing. Nor in any event can meat do harm, even when fed alone and in generous quantities, provided sufficient exercise in pure air is allowed; and, as a matter of fact, beyond its action in this direction, ample exercise is one of the most potent measures curative of chronic indigestion.

If at any time the appetite is entirely wanting, unless the dog is decidedly poor in general health, it is always advisable to either withhold the food entirely for forty-eight hours, or even longer, or give only a little milk now and then, say once in four or five hours.

In case of vomiting the treatment should be largely dietetic. Milk and lime-water, in proportion of three parts of the former to one of the latter, is one of the best combinations for use; for it is not merely a nourishment, but allays gastric and intestinal irritability. It should be given in small quantities at frequent intervals at first; then the allowance be more generous as the trouble abates; and very generally it will prove all sufficient in the way of treatment.

A foul breath may be accepted as evidence that there is acute indigestion as well as the old trouble, and the laxative and associate treatment advised for the former trouble should be administered.

Raw meat chopped fine, and its digestion made easier by means of bismuth and pepsin, will almost always be kindly received by the stomach; and if so it may be persisted in for a long time. But still monotony in diet should not continue long after a varied one will be as acceptable. Therefore if the raw meat should prove objectionable, or if it has acted well and decided improvement warrants a change, one may be instituted; but it must be gradual. To slightly broil the meat and mix with it a little well-boiled rice is the first step. Then, instead of the rice, stale bread may be used. Finely chopped greens that have been well boiled, as spinach, are the next additions which suggest themselves. These well disposed of, cautious experiments may be made, and the foods that are found to be well borne can, of course, be safely allowed.

As stated, the dietetic treatment is of the first importance in chronic indigestion; and when this is judicious, beyond, possibly, the use of bismuth and pepsin, no other medication will in many cases be required. In some, however, in which the general health is poor and there is eczema or other trouble associated, it will be advisable to give a tonic. All things considered, the tincture of *nux vomica* is the best.

For the largest dogs a safe dose is six drops; four for breeds of medium size; two for dogs like fox-terriers; and one for the very smallest toys.

It should be given three times daily, at meal times; and being bitter, the following expedient may wisely be resorted to: Cut several small slices of meat; pour on each one or two drops of the tincture; roll them up and toss to the patient. Or each dose may be given in a gelatin capsule which has first been partially filled with sugar, to hold the tincture. Enveloped in a slice of meat it will be taken readily.

The doses advised are only medium, and considerably larger ones might safely be given, yet they will be quite sufficient in most cases, provided they are persisted in. Again, the tincture varies in strength; some dogs, also, are peculiarly susceptible to it, consequently small doses and long continued, for months if necessary, is the only sure rule.

GASTRITIS.

The simple meaning of this term is inflammation of the stomach; yet as used by the best-informed physicians, mere affection of its lining membrane, such as exists in a large proportion of those who suffer from dyspepsia or indigestion, is not included under it, but it is limited to an inflammation of the entire thickness of the walls of that organ, which when acute is very intense and painful, and greatly endangers life.

While acute gastritis might, possibly, spring from other causes, as exposure to cold, unsuitable food, etc., to which it has been attributed by some authors, very rarely indeed is it produced by other than irritants given for the purpose of poisoning.

Vomiting is one of the most prominent symptoms, and usually for days it is frequent and persistent. Indeed, oftentimes water even cannot be retained. As for the matter raised, after the stomach has first been emptied, ordinarily it is a stringy mucus of a greenish tinge. In extreme cases, however, it is mixed with dark, clotted blood, and shreds of the gastric mucous membrane.

Thirst is excessive, and the poor victim will drink constantly, notwithstanding his stomach rebels, and empties itself within two or three minutes after every indulgence.

That he is suffering intense pain is very evident, for his expression is drawn and haggard, and breathing rapid and short. He is also extremely nervous, and generally inclined to change his position frequently; but in very severe cases he lies much on his belly, with his legs extended; some relief doubtless being afforded by the pressure.

As in all cases of tenderness and much pain within the abdomen its walls are drawn tightly. They are also generally shrunken; and when standing the victim

has what is commonly termed a "tucked up" appearance. Pressure of the hand, if fairly quick and superficial, will seem to indicate that the tenderness and pain are nearly uniform over all the parts of the abdomen; yet if the examiner is deliberate, and makes deep pressures slowly in the various regions, he will find that it is most intense under the left "short ribs" and at the "pit of the stomach."

The pulse is quickened from the first. There is also fever; and the nose is hot and dry. The bowels may be constipated; and this is the rule at first, but in the course of from twenty-four to forty-eight hours, diarrhoea usually sets in.

If death does not speedily occur from shock, and the disease is running to a fatal termination, the pulse increases in rapidity and becomes very feeble; the limbs are cold, the skin clammy, and the strength is shortly exhausted. Finally, convulsions occur, and the victim passes off in one of them.

There is but little danger of acute gastritis being mistaken for any other affection; and colic is the only one to which its resemblance is close, but a careful study of that will develop the distinctive features.

As stated, this affection is almost always produced by irritant poisons; but since vomiting so speedily follows their entrance into the stomach, that they are actually the cause can seldom be positively determined in any case. However, if a dog is taken suddenly ill and presents the symptoms described, it is quite safe to assume that he is a victim of one of those poisons. But any existing doubts as to the cause of the attack would scarcely influence the treatment, for were the case one of poisoning, in all probability the poison would have been speedily expelled; yet could the question be promptly settled in the affirmative—that a poison had been taken up—the first step in the right direction would be to pour as much "blood warm" water as possible down the patient's throat. This would likely cause him to vomit, and with the water returned would come up most, if not all, of the poison; but to make certain, another such drenching would be advisable. Were this treatment ineffectual and vomiting did not occur speedily, a teaspoonful of mustard in a tumblerful of warm water should be administered; and the dose be repeated in ten minutes if the first did not act.

But as urged in cases of poisoning by drugs capable of producing acute gastritis the poisons are almost always, if not invariably, vomited as soon as they have reached the stomach. Therefore, the first treatment must generally be for the purpose of subduing the pain and vomiting; which latter is very distressing. Powders containing morphia and bismuth promise best. Assuming the dog to be of medium or largest size breed, each powder should contain one-fourth of a grain of morphia and twenty grains of the subnitrate of bismuth. If he is about the size of a fox-terrier, it were advisable to have in each powder one-sixth of a grain of morphia and fifteen grains of bismuth; while for toys the dose should be one-eighth of the former, and ten grains of the latter.

In giving the powders, they should be shaken well back into the patient's

throat, and washed down with a little cold water. One powder should be administered every hour until relief is secured.

Instead of allowing the patient to drink, when ice can be obtained it were far better to have a large piece in a pan near him, for him to lap as inclined.

As for nourishment, the chances are that for several days at least, no matter how bland the food, none will be retained. But still, if the victim appears weak, he should have some from the first. The "whites" of raw eggs, mixed with a little milk or water, also milk and lime-water, act kindly in such cases; but the quantities of them at each dose must be small, not exceeding a tablespoonful of either, until the vomiting has nearly ceased. So carefully restricted, they can be given every five minutes in extreme cases; but the intervals should be longer if the need of support is not very urgent.

When the condition of the stomach has improved and these simple liquids are well borne, a little well-cooked rice or tapioca may be tried; and when they are kept down, broths and meat jellies and meat extracts will be in order. But for many days the foods must all be soft and very easily digestible.

If the vomiting be so persistent that it is impossible to nourish by the stomach, half a cupful of strong beef-tea, beef extract, or milk in which a raw egg has been beaten, should be injected into the bowels every four or five hours. And if the extremities are cold and collapse is threatened, from a teaspoonful to a tablespoonful of brandy must be added to each enema, according to the size of the patient.

For diarrhoea no special treatment will be required, because the morphia and bismuth will control that if it becomes urgent.

Chronic gastritis is liable to follow the acute form, and persist for many weeks, unless the treatment applied in the first instance is prompt and judicious. That affection requires the same treatment as chronic indigestion, from which it differs but little, excepting that there is tenderness on pressure over the stomach.

CHAPTER II.

COLIC.

THE term colic as commonly used, includes all painful affections of the stomach and intestines which are not attended by inflammation. Occurring in man, it may be flatulent, bilious, spasmodic, rheumatic, neuralgic, or in consequence of absorption of lead or copper. There are abdominal pains due to other causes that are usually termed colic; for instance, that attending the passage of gall-stones and gravel-stones. The intense pain in obstruction of the bowels and strangulated hernia is also given the same name. But colic in its literal sense is purely nervous and functional in nature; and in the majority of cases it is a spasm or series of spasms in the muscular coat of the intestines, and less often of the stomach.

While various causes may give rise to this affection in man, by far the most common is disturbance of the stomach and intestines brought on by over-eating or indulgence in indigestible food. This, being retained, undergoes decomposition. As a result poisonous gases are generated, which over-distend the intestines, also probably the stomach, and produce the spasms in the walls previously alluded to. Or the same may be excited by the gases if not of volume sufficient to over-distend, provided they are of especially irritating character. Again, irritant fluids generally abound where there is decomposition within the food canal, and these alone may produce spasmodic rigidity in the intestinal walls, although gases are almost always present to assist in creating this painful effect.

This variety is termed flatulent or wind colic, and it is the most common form which occurs in dogs. But their digestive organs are very strong and active, and these animals have marvellous ability to resist and speedily dispose of poisons and irritants which are the product of putrefaction, consequently it is safe to assume that with them gaseous distention is seldom alone caused by indigestible food and its decomposition, but is far oftener due to worms or some obstruction to the natural passage downward of the contents of the stomach or bowels. And the fact that their appetite is frequently perverted, as shown by their swallowing bits of wood, stones, straw, etc., renders it easy to support this theory.

Intestinal obstruction may occur in the absence of a foreign body. In some instances for a time there is loss of power in the muscular fibre of a small part of the intestine, while the parts above and below it still retain their normal action. The affected part collapses, and the tube is as tightly shut as it would be were it pinched by the thumb and finger.

As intimated, closure of the intestine may also be effected by acrid or irritating matters. In such cases probably a spasm occurs in the intestinal walls, and the tube is contracted. Obstruction is also produced by what is termed intussusception. By this is meant that one portion of the intestine slips into another, stovepipe-like; the outer part then contracts upon the inner and holds it fast. An intestine may twist and so become closed; it may even tie itself up into something like a knot. These are a few of the causes of obstruction.

Beyond the generation of gases during decomposition there is yet a powerful influence that is capable of producing them, and which authors have apparently failed to recognize; namely, intense nervous excitement, as caused by fright. Indeed the rapidity with which it acts in this direction is something to marvel at, as shown by a case which fell under the eyes of the writer. It was that of a pug caught in the jaws of a huge mastiff. The little one was not bitten, but merely held firmly at the fore shoulders, no other parts being touched by the teeth; yet within three minutes after her rescue — which was almost on the instant — her abdomen was of enormous size, and the distention clearly due to gas.

Colic is more easily detected in some dogs than in others. As a rule, when it occurs in house pets they plainly indicate their sufferings by moaning and ear-piercing cries. But large dogs seldom give such expression when in distress; therefore an attack of this sort in them is quite likely to be overlooked except by the most observing masters. All the victims of the trouble are very restless. They lie down, but in a moment are up and walking about, with tails tucked between their legs; and likely their backs are arched. In two or three minutes, however, they again lie down; but the recumbent position seems to intensify their sufferings, and they are soon on their feet. This extreme restlessness, by the way, is quite conclusive evidence of pain in some part of the body. If in the abdomen, the walls are retracted and hard; but when the attack is wind colic the abdomen is distended, and if tapped with the fingers it is resonant, like a drum. Another pronounced peculiarity exhibited by sufferers is their tendency to slink away and conceal themselves. This they will generally do if not quickly relieved; and once away they seldom return until the attack has entirely passed off.

Vomiting sometimes occurs; and if so, and the troublesome gas is in the stomach, much is generally expelled and the relief immediate. But vomiting is the exception rather than the rule when the stomach is so distended; and the pain seldom subsides, except under narcotics, until the gas has passed downward and out of the body. When the gas is confined to the intestines the pain is as severe as when the stomach is involved; but there is less danger in such an attack, for the expulsion of gas is as a rule more easily effected from the intestines than from the stomach.

Pure and simple colic is at first not attended by inflammation; therefore fever is absent, the nose remains cold, and the pulse is only a little more rapid than usual. But if the attack is severe and has persisted for several hours, and

the cause still remains, inflammation of the stomach or bowels, or of both, is very liable to set in. Hence relief should in every instance be effected as speedily as possible.

In very severe cases, where the abdomen is greatly distended, "to make assurance doubly sure," it is best to assume that the gas exists in the stomach as well as in the intestines, and endeavor to dislodge it both by the mouth and bowels. First an emetic should be given; and one of the most efficient and harmless is powdered ipecacuanha; the dose of which for a dog of the largest breeds is one-half a drachm. This should be put into a cup of warm — not hot — water, and poured down the sufferer's throat; and if it does not act in ten minutes, the dose should be repeated.

After giving the emetic, an injection of quite warm water should be administered. As for the necessary quantity of water, it should be forced into the bowels until it runs out by the nozzle of the syringe.

If as hot as can be borne by the hand without its being scalded, the water will oftentimes subdue the pain more speedily than even the most powerful narcotic. It is also very relaxing, and where spasm of the intestine is the obstruction, it will generally quickly relieve it. When the obstruction is overcome, with the water that comes from the bowels a volume of gas will be discharged, and the pain at once lessen, if it does not disappear entirely. Should not such a happy result follow, another and still another injection should be administered after intervals of ten or fifteen minutes.

Should gas not be brought up by the emetic nor drawn downward by the injections, the sufferer should be put into a tub and have his abdomen bathed for ten or fifteen minutes with hot water. This also failing to afford relief, half a teaspoonful of laudanum in a little water should be poured down his throat.

It is well to say here that a sign of commencement of relief is "rumbling of the bowels," which indicates that the gas is moving downward; the spasm in the intestinal walls or other obstruction giving way to the natural "peristaltic" or worm-like movement of the intestine.

In about an hour the laudanum will have had nearly its full effect. If the abdomen is still greatly distended and the pain as severe, a physician should be sent for, and the messenger should request him to bring an instrument for tapping.

The hollow needle of a hypodermic syringe will answer well for the purpose. Puncturing the abdominal walls by means of it is not, as might seem to non-professionals, a serious operation, and it is scarcely possible for harm to result. Moreover, the relief is immediate. Most assuredly it should be resorted to in all cases in which the distention is great and the other measures advised have failed. Nor should there be any delay then, for continued pressure against the heart is liable to stop its action; and, indeed, in some neglected cases it was found that so great was the distention that certain abdominal organs were literally torn from their attachments, and death resulted in a few moments.

As for the point in the abdomen at which to introduce the needle, the physician can easily determine that by percussion. Very generally it will be necessary for him to enter a little below the ribs on the left, but not far from the median line. He should then strike the stomach, where the greatest danger from the distention is usually located. Were the gas largely confined to the intestines, near the middle of the abdomen and to the left would generally prove the right location. But did he fail to reach the gas on the first trial, he should try again, and still again if necessary.

A word as to the action of opiates in colic. One-half a teaspoonful of laudanum has been advised for the largest breeds because a smaller dose would likely prove inert. This would be between sixty and seventy drops, or nearly equal to three grains of opium and three-eighths of a grain of morphia, yet it is customary with writers on canine diseases to advise in those cases doses only one-third as large. But such are simply delusive. Very generally with one-half a teaspoonful of laudanum nothing is accomplished; and, indeed, in no small proportion of cases of colic, very much larger doses of opium apparently have no more effect than water. Hence the reason for urging that they be tried but not relied on; and if the first large dose fails, that the gas be at once evacuated by puncturing the abdominal walls.

The pain relieved, the patient should be kept as quiet as possible for a day; and if allowed food, it should be milk, or milk and lime-water only.

Occurring in mature dogs or quite old pups, and treated judiciously and promptly, colic is not likely to prove fatal except in a small proportion of cases. If, however, it is neglected, inflammation of the bowels with all its attendant evils may result.

The only disease with which colic is liable to be confounded, aside from intestinal obstruction, just considered, is peritonitis; but that is an inflammatory disease, and there is fever, besides other signs of great constitutional disturbance, as very rapid and small pulse, and he who familiarizes himself with the symptoms of both affections could scarcely be mistaken.

When colic attacks very young puppies it generally ends fatally, and about all that can be done with a fair prospect of affording them relief is to give laudanum every hour until their moaning has ceased. The dose should be adjusted to the age; and for the largest and medium size breeds, one drop of laudanum for every week of life would be right. For fox-terriers and the like, this might not be any too large a dose, but it would be safer to reduce it nearly one-half, and give one-half a drop for every week; while from one-fourth to one-third of a drop would be suitable for toys.

That is, assuming the pup to be of medium or large size breed and eight weeks old, he should be given eight drops of laudanum every hour until relieved; while if a toy and of the same age, the correct dose would be about two drops.

ACUTE PERITONITIS.

A delicate membrane lines the abdomen and envelops all the organs therein,—the stomach, intestines, liver, kidneys, etc. This is called the peritoneum, and inflammation of it is peritonitis. It is a grave disease always, and especially so in dogs, in whom it is far more easily produced than in man.

On examination after death, which has occurred in the stage that is usually fatal in these animals, the affected organs are found more or less covered by an exudation, that generally appears flaky and of yellowish tinge. There is, as a rule, considerable watery fluid in the abdominal cavity; and here and there, if it is not diffuse, is seen very decided redness of the intestinal surfaces. Those surfaces are glued together more or less firmly, also to the organs within the cavity, and to its walls.

The causes of this malady are many and varied, and include blows, kicks, penetration of the abdominal walls, etc., also injuries received during whelping, and possibly exposure to cold and wet. It may be an extension of inflammation in adjacent organs or parts, due to the bursting of abscesses within the abdominal cavity, a complication of purulent pleuritis or empyema, or a part of a general inflammation that exhibits a decided preference for like membranes throughout the body, such as is noted now and then in infectious diseases. It also often occurs in pyæmia, or pus-poisoning of the blood.

To this disease dogs are very susceptible, and many influences which man might successfully resist are capable of exciting it in them. For instance, if a dog suffers from severe bowel trouble, as enteritis or dysentery, and the inflammation is not speedily controlled, it is liable to extend to the peritoneum. Again, it has seemed that colic even invited the occurrence of peritonitis. But doubtless in most cases it is caused by intestinal obstruction or perforation of the intestines. The latter, by the way, seems generally induced by worms, which bore through the intestinal walls far oftener than is commonly supposed.

The symptoms of peritonitis vary with its extent, severity, and the causes which produce it. Occurring as a complication of uterine or intestinal inflammation or obstruction, it usually develops slowly and insidiously, consequently in some instances its presence is not detected until after death. When there is perforation, however, and in like cases in which the peritoneum is suddenly and violently attacked, the inflammation is soon intense and spreading rapidly.

In man its progress is attended from the first by an agonizing, cutting, boring pain, that is greatly aggravated by pressure and movements of the body. But dogs, as a race, are naturally much less sensible of pain than their masters. Again, it is a very remarkable fact that in many cases of peritonitis in them there appears to be but little pain; and even firm pressure of the hand is often borne without shrinking. Indeed, this seems to be the rule. Like all others,

however, it has exceptions, and now and then cases of peritonitis are met with in which the pain is evidently very intense, and greatly aggravated by pressure over the abdomen.

In severe attacks of this malady the victims are usually restless at first, and change their positions frequently, walking with a stiff and awkward gait; but after a day or two they become quiet, seemingly resigned, and even require some urging before they will move about.

The abdomen is shrunken at first, its walls being contracted and rigid, but soon they relax and there is considerable distention. Deep inspiration is painful, consequently avoided, and the breathing is quickened. There is fever; the pulse is rapid, thin, and small; the expression anxious, and the eyes reddened and sunken. Vomiting may occur in the early stages, yet if so it is only occasional. Later, however, it is generally frequent and persistent. Thirst, loss of appetite, and obstinate constipation complete the list of important symptoms. The latter is not constant, and diarrhœa may exist from the first; but the rule is that the lower bowel is powerless to unload itself until a marked change for the better has occurred or the discharges become involuntary as death approaches.

In a well-defined case of peritonitis caused by perforation, the chances are nearly all against recovery. It may, however, occur if the disease is an extension of an inflammation in the womb or intestines; but even then the outlook is exceedingly grave, for the patient's strength fails rapidly, and is almost always wasted before the affection has run its course.

It may be assumed from this that treatment does not promise well, but of course it should always be instituted. If applied early and faithfully, cloths frequently wrung from very cold water not only afford some relief, but tend to retard the inflammation. After the disease is well fixed, however, and the inflammation has spread and become intense, a stimulating application is indicated, and the following should be resorted to: Tincture of aconite root, chloroform, and aqua ammonia, of each three drachms; compound soap liniment, six ounces.

This should be freely and quickly rubbed into the hair over the abdomen, and at once covered with several thicknesses of cotton batting.

The need of opium in this disease is urgent, not only to subdue pain but to lessen the tendency of the inflammation to spread and grow in intensity; and its convenient form, laudanum, should be given in doses adjusted as in colic; while they should be repeated as often as every hour until the sufferer is clearly under its effects and dosing most of the time; in which state, if possible, he should be kept continuously by this means.

There appears to be a disposition on the part of many practitioners in canine diseases to treat fever always, no matter what its association or cause; but in this instance it certainly would not be wise, for the remedies usually employed are sure to do more harm than the high temperature.

An injection of warm sweet oil or soapsuds, once daily, would, perhaps, be

advisable, considering that a seeming case of peritonitis might be one of intestinal obstruction merely. Cathartics, however, are forbidden.

As for the diet, that may be the same as in severe intestinal inflammation. Whiskey or brandy must be given if collapse is threatened.

In a word, to make the applications advised, narcotize the patient and keep him narcotized, and maintain his strength by means of concentrated foods and stimulants, is about all that can be rightly done in the way of treatment.

DIARRHŒA.

Diarrhœa is not a disease in itself but merely a symptom that attends many conditions of ill-health. Speaking generally and using the popular expression, it is looseness of the bowels, the discharges being excessively frequent and more fluid than usual.

It may be acute or chronic; and the following are the principal varieties of the first form, together with their causes:—

Irritative diarrhœa includes all diarrhœas which are produced by agents which irritate the lining membrane of the alimentary canal, as attacks attended by pain and griping that occur in puppies in consequence of excessive acidity of the mother's milk, or improper feeding after weaning. In these little ones, also, such attacks are very frequently caused by worms. In mature dogs this form of diarrhœa may be induced by over-eating, food that is very difficult of digestion, or foods to which the digestive organs are not accustomed. Again, tainted foods, as mouldy bread, and milk that has been long exposed to foul emanations in very hot weather, are capable of causing it. As for meats and their products that have undergone putrefactive changes, to the poisons generated in them many of the attacks of this variety of diarrhœa in man can safely be attributed. Members of the canine race, however, have a far stronger inherent capability of resisting these noxious agents, and one that would render their masters dangerously ill might not have any appreciable effect on them. But still there are limits to this fortunate provision, and these are varied somewhat by the conditions of life. Moreover, experience has taught that, occasionally at least, meats and soups, long kept and exposed to bad and hot air, are the causes of irritative diarrhœa; and the same may be said of fowl water. Bones are also occasional causes of the trouble in dogs, but, thanks to nature, only those that are large or very hard and have sharp points or edges are sufficiently irritating; and they even are harmful only when digestion is weak. When the natural refuse, which should be thrown out by the bowel, becomes dry and hard, or in other words there is constipation of long standing, the lumps may act in the same way as foreign substances. *En passant* it is well to say that such may still be in the bowels even

after the looseness has existed several days. Another cause of diarrhœa may emanate from the liver, but attacks due to that are rare. Finally, it may be produced by powerful cathartics, and excessive secretion from the intestinal surface.

Diarrhœa occurring in enteritis and other inflammations of the intestine is termed symptomatic. Mechanical diarrhœa may be produced by the cathartics which physicians term salines, as Epsom salts, that cause the blood to part with much of its watery constituent, pour the same into the intestinal canal, and hurry it down and out of the body before it can be reabsorbed. The same form of diarrhœa may occur in pulmonary and heart diseases, in consequence of obstructed circulation of blood in the intestinal vessels.

Man occasionally suffers from nervous diarrhœa produced by the painful emotions, fright, grief, anger, and the like; and quite frequently it follows an attack of severe pain. Dogs are much less abundantly supplied with nerves that respond to these influences, yet diarrhœa is frequent with them after prolonged excitement, as experienced on railway journeys and at dog shows; which fact may be accepted as evidence that they are not exempt from this variety of disease. It is also obvious that the liability of its occurrence is much greater if excitement is experienced while yet digestion is in its earlier stages.

Another form of diarrhœa is termed vicarious. This occurs where the skin, kidneys, or lungs are seriously affected and unable to do their share in the work of eliminating the waste from the system. For instance, in the course of chronic kidney disease attacks of diarrhœa set in now and then, and are salutary, for by the means of them poison which the kidneys could not throw off is expelled. Chilling of the surface of the body suddenly will produce vicarious diarrhœa by causing a great flow of blood to the internal parts and an excitement in them, if not congestion or inflammation. Intense heat may also have like effect. Again, in many acute diseases this form of diarrhœa is one of the early symptoms, and induced by the specific poisons or germs. Finally, there is the so-called colliquative diarrhœa, which sets in near the close of fatal chronic diseases.

When the discharges are scanty, consist largely of mucus, and have the appearance of holding iron-rust or brick-dust, they are indicative of worms. If, however, they are very frequent, nearly all mucus and tinged with blood that is of bright red color, and are accompanied by much straining, that there is a bone or other foreign body lodged in the lower bowel should be strongly suspected. Assuming again that the discharges are frequent, scanty, consist largely of mucus with blood intermingled, there is straining and evidently colicky pains, loss of appetite, thirst and fever, and pressure on the abdomen causes shrinking, the case is probably one of dysentery.

The importance of attacks of diarrhœa depends upon their causes; and where these can be removed recovery will likely soon occur. The irritative is but rarely dangerous if rightly treated except in very young puppies, which are

speedily exhausted when the intestinal discharges are profuse. As for nervous diarrhœa, that is commonly encountered in dogs that are subject to convulsions; in consequence of which the intestinal trouble is usually more obstinate.

The treatment of diarrhœa also largely depends upon the cause which produces it. When attributable to undigested food, the discharges should not be stopped at once by medicines, for, the bowels dammed up as it were, the simple diarrhœa might be converted into a serious trouble. Again, these food particles are none too speedily expelled by the natural process, and their slow passage over the highly sensitive lining of the intestines tends to make it more irritable, if not inflame it. Consequently, in all cases where the diarrhœa has but recently occurred, say within forty-eight hours, the first indication is to empty the bowels by the means of a cathartic. And of agents capable of producing the desired result one of the safest and most effectual in this class of cases is castor-oil, the dose of which for dogs of largest size should not be less than two tablespoonfuls. But for the reason that non-professionals cannot be acutely discriminating in disease, and an attack of enteritis, dysentery, or other severe trouble might, possibly, be mistaken for simple diarrhœa, it is always advisable against such error to combine laudanum with the oil; and about half a teaspoonful is the right dose if the patient is of large breed.

These stirred into three or four times as much milk, should be poured down his throat. The diet should then be restricted to milk and lime-water; and in the absence of a small enclosure, rest ought to be enjoined by means of a chain.

In the course of ten or twelve hours the oil will have completed its work, and, ordinarily, soon thereafter the discharges should considerably decline in frequency. As long as they are doing so and the dog seems strong and otherwise well, to continue the dietetic restriction is all that is necessary. If, however, they persist, are frequent and watery, and there is straining, it will be well to obtain powders of Dover's powder, each of which ought to contain ten grains, assuming that the patient is of medium or large size, while five grains would be right for breeds of the size of fox-terriers, and two grains for the smallest toys.

The contents of the powders may be enveloped in thin slices of raw beef; and a dose should be administered every two or four hours, according to the severity of the diarrhœa.

Before going further it is well to say that while undigested food is likely to be expelled within forty-eight hours where there is brisk diarrhœa, such might not be the case; moreover, a dose of castor-oil and laudanum can do no harm if it fails to do good; therefore, if the caretaker is in doubt as to whether or not a cathartic is required, he should always pass to the safe side and give them.

Simple irritative and nervous diarrhœas will yield to these measures of treatment if the food is properly chosen; and, indeed, as already stated, merely a judicious restriction of the diet is all that is necessary in much the largest proportion of such attacks in mature dogs. Were the treatment dietetic solely and

the patient did not do well on milk and lime-water, or this food seemed distasteful to him, flour gruel should be tried.

In making this the flour should be first baked in a shallow pan until browned, then slowly stirred into the milk and boiled for several minutes. It is a very simple yet quite effectual remedy, and he is wise who gives it the preference, at least for a time, over all others when diarrhœa of mild type occurs in delicate breeds, as toy-terriers.

Where the signs seem to indicate that a bone is lodged in the bowel, an injection of sweet oil should be administered as advised in "Intestinal Obstruction."

When diarrhœa is accompanied by vomiting it is customary to call it "bilious," under the impression evidently that the cause is in the liver. This may be true in a small proportion of cases, but certainly not invariably, and the term "bilious diarrhœa" is of doubtful propriety, indiscriminately used as it is, and more especially since calomel is the remedy so generally sought.

Vomiting and diarrhœa may occur together without the liver being involved any more than in a mere irritative diarrhœa. Nor is it safe to draw conclusions from disturbances of man and apply them to dogs, for as a matter of fact, unlike the former, dogs are but rarely bilious. Furthermore, disturbances of the liver are far less liable to excite vomiting in them than in man. Again, the greenish, yellowish bile with the mucus and other matters raised in cases termed bilious, is not the cause, but, instead, it is the consequence of the vomiting, the same being sucked into the stomach from the intestine during the expulsive efforts. Finally, this may occur and bile be vomited without any disturbance of the liver whatsoever.

Perhaps no better opportunity for dispelling some prevalent delusions on this subject will be afforded, hence the discussion is carried a little further.

There are three conditions to which the term bilious might, possibly, without impropriety be applied. One is indolence, as it were, on the part of the liver, in consequence of which the noxious materials which it ought to remove are left in the blood, and find their way out through other secretions. Another is obstruction in the gall-duct, which prevents the accumulated bile from taking its natural course into the bowels; but instead it is reabsorbed into the blood, from which it escapes by the kidneys, skin, secretions of the glands of the mouth, etc. This condition existing, the intestinal discharges are no longer natural in appearance, but clayey, slate-colored, or nearly a dull white; while the urine is very dark, for the reason that it is loaded with the coloring matter of the bile. But such intestinal discharges are rarely watery; on the contrary, they are generally either of natural consistency or more solid and drier than usual. A third state which might be termed bilious is an unhealthy condition of the bile secreted; and in this, if the discharges are sufficiently acrid and irritating, there would likely be diarrhœa, yet it is doubtful if that peculiar form often occurs in dogs.

From this it will appear that it is but rarely, if ever, necessary in diarrhœa to administer medicines for the purpose of directly affecting the liver. Moreover, the giving of such must be very largely experimental, for even physicians can seldom determine with near certainty the state of that organ. Furthermore, the various conditions would require distinct forms of treatment, and drugs that stimulate the liver and cause an increase in the secretion of bile would certainly do harm were they given in obstruction of the gall-duct, during which there is present more bile than can be properly disposed of.

The drift of this discussion is towards calomel and other mercurial preparations, the use of which some writers of influence appear much too ready to advise in diarrhœa, they evidently assuming that the cause of the same can often be rightly attributed to the liver. This is unfortunate for various reasons. First, as stated, when used it must generally be indiscriminately — a method that is never safe with drugs. Again, that they act on the liver in any instance, as so generally supposed, is by no means certain. The chances are, however, that they do have a slight stimulant effect upon that organ in some impairments, although they act largely like other cathartics. But while mercurials may, and probably do, have some stimulant effect upon the liver of man, it is highly doubtful if the same be true of dogs; for seldom can any of the constituents of bile be found in the intestinal discharges produced by even large doses of calomel. Still again, these animals are decidedly more susceptible to the action of mercurials than man; and while the latter is often unpleasantly affected by them, such experiences are far more frequent with the former, the fact being obvious that with calomel there is considerable absorption; also, that a portion of it is changed to the mercuric chloride, for evidence of its poisonous properties have been detected.

Considering all this, only one conclusion is possible, namely, that calomel is neither safe nor essential in popular practice in diarrhœa. Nor is it a proper agent to use where the intestinal discharges are clayey yet not watery, for then, the gall-duct being obstructed, it can be no more efficient than any other cathartic; moreover, considering its nature, it might irritate the lining membrane of that part of the intestine into which this duct opens, and so favor a continuance of the obstruction.

Such obstruction is very generally due to an inflammation of the lining of the gall-duct, which is quite sure to disappear if left to itself; and the only treatment indicated is to keep the intestine as free as possible of irritating matter; and for that purpose there is nothing better than magnesia, in fairly small doses and repeated as often as necessary to keep the bowels moving two or three times daily.

Returning to the treatment of the various forms of diarrhœa, if there is vomiting, a cathartic will not likely be retained; therefore the work of freeing the bowels must, at least for the time being, be left to them, and efforts be made

to quiet the stomach. The subnitrate of bismuth is the remedy that suggests itself, for it acts well, not only on this organ, but on the intestines, relieving and soothing the irritability of their lining membranes; and thus it checks both vomiting and diarrhœa. This medicine should be given in large and frequent doses, every two hours being none too often; and there will not be any danger of poisoning from it if the drug is pure, even if it be persisted in for a week. One teaspoonful is suitable for mature dogs of breeds of medium and largest size; while one-half this dose can safely be given to all about the size of fox-terriers; and one-fourth of a teaspoonful to the smallest toys.

The bismuth should be obtained in a box or bottle, not in one large powder, lest it pack down; and in preparing a dose it should be shaken into a spoon. Then by means of a card standing on the edges of the spoon, all above them should be swept off, leaving it *even* full. This drug may be easily administered, it being necessary merely to drop it, in dry form, as far back in the throat as possible and encourage the patient to take a few swallows of milk or water. And since it acts mechanically upon the irritated mucous lining of the stomach and intestines, it will be well to restrict the diet as much as possible while it is being given.

If bismuth be administered in proper quantities, it alone will generally control vomiting; but failing to do so in the course of a few hours, with it should be combined the sulphate of morphia. If the patient be of medium or largest size the dose of the latter should be one-fourth of a grain; if a dog weighing between twenty and thirty pounds, it would be one-eighth; while for a toy it would be about one-twelfth of a grain. Divided up into powders, each containing the right dose, one should be given with each dose of bismuth.

Reverting to the dietetic treatment of diarrhœa, some authors as well as most non-professionals think that when the intestinal discharges are very watery and copious, water, and possibly other fluids, must be withheld, being possessed of the delusion that what is taken into the stomach in this form is hurried through the intestinal canal, and that the more the patients drink, the worse their diarrhœa. This is a relic from the musty past. Nearly all, if not all, the water in the discharges comes from the blood; and if the drain on it is great, serious accidents in circulation are liable to result in consequence of that vital fluid being too thick, as it were. Therefore, this loss of the fluid portion of the blood should be compensated for by the giving of such fluids as pure water, milk and lime-water, milk and the whites of eggs, or meat products. These can always be allowed freely excepting in vomiting, during which they may occasionally be contra-indicated; but not always, for in some instances a long and deep drink of ice-water will stop vomiting when drugs have failed, and certainly such an indulgence could do no harm in diarrhœa, nor even in dysentery.

This calls to mind another dietetic absurdity that is very prevalent; namely, that beef-teas, meat extracts, meat jellies or essences, and the like, cause diar-

rhœa to persist. Where they are rightly made of meat alone and not so "rich" as to tax digestion, such foods can safely be allowed; and the diarrhœa will not be unpleasantly affected by them, nor by scraped raw, lean beef, which should always be given when the other simple foods fail to support, and the strength of the patient threatens to decline. If those meat products appear to be well borne, properly digested, and agreeable to the patients, there may be added to them a little boiled rice or arrowroot; and in any event it will be advisable to thicken the beef-teas, extracts, or essences with gelatin; for the stomach generally receives this combination more kindly than the fluids alone; and even in cases of vomiting it often remains down.

At variance with the custom of writers on canine diseases, no astringent remedies have been advised, for the reason that they are not required in diarrhœa, and would likely in any event do more harm than good. The purpose of treatment is not merely to lessen the number of discharges daily, for it is even more important that the cause be removed. That at first may be indigestible foods, but soon there is irritation of the mucous surface of the bowels, which constitutes another cause. Now let this be overcome, and the diarrhœa will voluntarily cease. It may be argued that with the mucous membrane of the bowels nearly back to the normal condition its secretion will often still be excessive and astringents should be used. Not so, however, for properly prepared flour-gruel is as active in this direction as those drugs, and does the work quicker and better.

Diarrhœa in suckling puppies is usually the direct consequence of indigestion or worms; but it must not be forgotten that constitutional feebleness and unfavorable hygienic surroundings, and especially quarters that are too small, damp, and filthy, increase the liability to attacks of this affection.

Occurring in the first three or four days of life, and attended by colic and great prostration, the chances are that the diarrhœa is due to excessive acidity of the mother's milk. This defect is serious indeed, and requires prompt and special treatment, which the reader will find discussed at length in "Kennel Secrets," beginning page 275. An exhaustive discussion of the treatment of worms, the essential formulas, and correct doses for each week during early puppyhood, are also to be found in the same volume.

The digestion of puppies, like that of infants, being very weak, it is not surprising that looseness of the bowels often occurs at the weaning; and unless the discharges are quite watery and frequent, there is, ordinarily, scarcely occasion for uneasiness, but still the sign should never be disregarded. And generally it indicates that the change from the mother's milk is being made too abruptly.

Soon after the bowels are disturbed by indigestion or other cause, the discharges, as a rule, occur at once after the feedings and every two or three hours. At first they are merely more liquid and copious than usual and of more pronounced odor. After a time — which may be very short — they undergo various other changes. Often they are like water with a yellowish tinge. Now and

then, of this character, they are flaked with white or green ; and occasionally they are of quite a deep green color throughout. At times also they consist largely of mucus. In such instances, if the mucus is present during the first day or two of an attack, it is largely suggestive of worms as the cause ; but if late in making its appearance, it is indicative, rather, of irritation or real inflammation of the lining membrane of the intestine.

An attack resulting from mild and transitory cause would scarcely change the general condition of a puppy ; but did the diarrhœa persist several days, even if of simple form, evil effects would likely appear, in languor, impairment of the appetite, loss of weight, flabbiness of the muscles, and a pallor of the mucous membrane of the lips and tongue. But to delay until such signs were manifested, even were they not very pronounced, would always be hazardous ; and to overcome the diarrhœa as soon as possible, by good management or use of drugs, should be the rule in all cases in which the subjects are quite young.

If the discharges are of offensive odor or greenish color, or there is pain, the bowels should be quickly swept, as it were, with a cathartic ; and castor-oil appears the best for general use, because it not only removes the irritating contents, but has a secondary, soothing action upon the mucous membrane. Assuming the puppies to be about five weeks old and toy-terriers, one-half a teaspoonful of this would be near right. For pugs, fox-terriers, and the like, also breeds of medium size and the same age, the dose should not be less than a teaspoonful. While the largest breeds, provided the puppies are of goodly size and hardy, might take nearly twice this quantity.

The oil administered, the diet should be restricted to milk, the same being slightly thickened with flour that has been baked until of a nut-brown color, and the whole boiled for several minutes. Or if the discharges are sour smelling, for a day or two at least, instead of the flour, it will be well to put into the milk what is known as prepared or precipitated chalk. This is a simple and practically harmless agent, therefore nice adjustment of doses is not required. The dose for puppies of medium or large size breeds, and five or six weeks old, is about one-half a teaspoonful ; while one-fourth of a teaspoonful will be suitable for all others. And that the medicine may have a decided effect it will be necessary to give it as often as every two hours. This hits the feeding-times ; but if the dose advised is not taken voluntarily in the milk it should be forcibly administered. The sourness disappearing and the diarrhœa much improved, a return may be made to the flour gruel. If, however, the discharges continue frequent, it will be wise to persist in the use of the chalk.

When there is pain, as indicated by crying or moaning, laudanum should be administered as advised in colic, and the first dose be with the castor-oil. Or even if the attack does not seem painful but the discharges are many and watery, the laudanum ought to be given in precisely the same way.

Under the use of flour gruel or chalk, and laudanum, if the diarrhœa does not

subside readily it will be well to give the subnitrate of bismuth instead of the chalk. A quantity of the same that can be taken up with the thumb and forefinger, or what is called a "good pinch," is about the correct dose for puppies of all breeds ; and it is merely necessary to drop it, in dry form, into the mouth and as far back as possible onto the tongue. As for the intervals between doses, they should be from one to two hours, according to the severity of the diarrhoea.

Cows' milk is the nearest approach to the ideal food for puppies, also for mature dogs in many forms of disease. Now and then, however, while it constitutes the diet, the discharges from the bowels are flaky and yellowish-green, or contain whitish, cheesy lumps. The indication then is not to withhold this food altogether, but to dilute it more ; and this done wisely, milk will be no burden to the digestive organs. The same is true in cases in which curdled milk is vomited ; and if it is then noticeably sour, besides dilution it will be necessary to meet the acidity with lime-water.

Diarrhoea in rapidly maturing puppies or mature dogs may become chronic, but such result is never likely to occur unless the acute attack is neglected or treated improperly.

The essential treatment of this form is identical with that of chronic indigestion ; for the latter is not only a complication always, but very generally it is ultimately a cause, which if removed the diarrhoea will disappear voluntarily.

CHAPTER III.

DYSENTERY.

It is highly important that the characteristic and distinctive features of diarrhœa and dysentery should be given such decided prominence that it will be impossible to confound these diseases, for the reason that the former may be harmless or even beneficial, whereas the latter is a serious affection, in which there occurs an inflammation of the lower bowel — so called the large intestine — and glands therein.

At first the mucous membrane of the intestine is congested, then inflamed; and the glands in question swell and eventually ulcerate unless the disease is stayed. This membrane may also be covered with patches of false membrane similar to that which appears in diphtheria, the affected intestine be swollen and boggy, and its mucous lining be detached in places, leaving them raw and ulcerating surfaces. Again, the inflammation may extend up from the large intestine and involve the smaller bowel.

From this mere glance at the changes which may occur in dysentery it is plainly evident that it is an affection of much more serious character than diarrhœa. But, fortunately, it is far from common in dogs. Indeed, severe forms of it are exceedingly rare except when it occurs as a complication of other diseases.

There are several distinct types of this disease, each of which has special causative factors; but a general discussion should suffice, since the treatment, the all-important consideration, is materially the same in all.

Among the influences which strongly favor the occurrence of dysentery are unhygienic conditions such as exist in neglected and filthy kennels. Although the dog is blessed with a marked immunity against the ill effects of tainted foods, they are yet at times capable of giving rise to this disease. So, too, is exposure to sudden and great atmospheric changes. The cause may also exist in the water; and although, while intensely heated, dogs may often drink from stagnant pools without harmful results, now and then dysentery follows such indulgence. It also sometimes follows diarrhœa, and seems attributable to failure to apply proper treatment to the simpler trouble.

When a case of dysentery occurs in a large kennel the chances are many that other cases will soon break out, suggesting the generally accepted fact that it is sometimes a germ disease and caused by a specific bacillus. This strongly

probable theory, however, is yet to be proved. There remains the so-called diphtheretic dysentery alluded to, in which the intestinal inflammation is accompanied by a true diphtheretic exudation.

Like diarrhœa, dysentery may be acute or chronic ; but the latter form is one of the novelties in canine practice, because the strength is generally exhausted before it is reached, or the inflammation has extended and involved deeper and more vital parts.

Frequent, small, and bloody discharges, with straining and colicky pains, if not severe colic, are the most pronounced symptoms. There is usually, also, some fever, which, however, may be wanting at first ; and then, as a rule, when it appears, it is slight, and slowly increases in intensity. The appetite is lessened or wholly lost ; the nose is hot and dry ; there is thirst ; the tongue is coated ; the skin is soon dry and harsh ; and the abdomen tender to the touch.

In severe cases, unless there is considerable bloating, the back is arched, and the movements are stiff and evidently painful.

If from the first the attack is dysentery, one or two discharges from the bowels are usually quite large and nearly natural ; then follows a brief period of diarrhœa, and likely vomiting. Shortly the discharges are frequent and small, and they lose their normal character, and consist mainly of mucus, or "slime" as it is commonly called ; blood makes its appearance in them, and it is not long before they acquire a very offensive odor.

In occasional instances they are largely of mucus that has the color of wood-ashes, while now and then are to be seen in them thin shreds or quite large pieces of dead matter of dark-brown color.

The disease progressing, mucus largely or entirely disappears from the discharges, which are now watery and slightly colored with blood ; or they may take on a resemblance to pus. The sufferer emaciates and loses strength rapidly ; and if his disease is likely to end fatally, his feet grow cold, his skin clammy, and he gradually falls into a stupor from which he never arouses.

A bone lodged in the lower part of the bowel is the one condition likely to be mistaken for dysentery ; but that may be excluded if there is considerable constitutional disturbance, as fever, and the discharges do not contain blood of bright red color in considerable quantity and apparently fresh.

It is not always easy to determine while yet an attack is recent whether it is one of diarrhœa or dysentery ; but keeping in mind the fact that the former is far the most common, that during its earliest stages at least there is seldom, if ever, much straining or very severe colicky pains, and that the patients as a rule seem quite as well as usual, whereas in the latter pain and straining are commonly present near the first of the attack, and these symptoms are attended with languor, impairment of appetite, thirst, and other signs indicative that quite severe illness is on or threatened, it ought not to be difficult to discriminate between these affections.

As for the danger of dysentery being mistaken for enteritis, it is possible for a time, for it is often ushered in by the latter, the stomach also being involved — as evinced by vomiting; but it would scarcely be long before doubts could be set at rest, for the discharges in enteritis contain blood only in rare instances, and in such, pain and tenderness are generally sufficient to indicate severe and widespread inflammation of the bowels. Moreover, in that affection vomiting is usually quite persistent.

The treatment appropriate for dysentery does not differ materially from that required in diarrhœa. Indeed, in the early stages the line laid down for the latter should be taken. That is, a dose of castor-oil and laudanum should be given at the outset to clear the bowels, and be followed by suitable doses of Dover's powder; while the diet should be restricted to milk and lime-water.

This treatment very generally cuts short attacks of dysentery. They terminate before the bowels are sufficiently affected to give rise to serious symptoms, and the disease is converted into simple diarrhœa. If, however, such happy result is denied, and the discharges become bloody, the following mixture should be obtained: Carbolic acid, five grains; sulphate of morphia, three grains; sulphate of sodium, three drachms; water, two ounces.

Of this one teaspoonful should be given every two or three hours if the dog is of medium or large size; one-half a teaspoonful to dogs weighing from twenty to thirty pounds; while one-fourth of a teaspoonful would be right for the small toys. Under its use the discharges will at first show only slight decrease in frequency; but usually within twenty-four hours the straining will have been largely overcome and the pain controlled. Then the blood will quickly disappear, and the movements of the bowels slowly and surely lessen.

Only in rare instances do the discharges consist largely of greenish mucus, and in such the liver is seriously affected. But calomel, so often resorted to, is never required in this condition, for a much simpler agent will act more speedily and far better. The one in question is capsicum or Cayenne pepper, and the dose appropriate for dogs of largest size is five grains; three is sufficient for others of medium size; two for such dogs as fox-terriers; and one for the small toys.

This drug should always be given in pill form — concealed in a little scraped raw beef — once in three hours; and only four or five doses will be required to cause a profuse flow of bile and displace the greenish with a grayish color.

Rectal injections of starch-water, etc., are eminently satisfactory in the treatment of dysentery in man, but being stoutly resisted by dogs, are objectionable; moreover, but rarely if ever are they required. Were injections deemed necessary, all other measures having failed, as much warm water as possible should be injected into the bowels and allowed to come away. Then should be administered an injection consisting of half a cupful of milk into which has been well stirred the white of an egg and one drachm of the subnitrate of bismuth. This

should be held up for several minutes, by means of a towel pressed firmly over the opening of the bowel. And if they seem to act well, such injections may be repeated every two or three hours. But, as said, this treatment is rarely necessary where the other measures advised have been properly applied.

While the indication generally is to clear out the bowels early in dysentery by means of castor-oil, it might not be advisable to administer it had the disease been on several days. Indeed, did the patient appear very weak and failing, or were the discharges very watery, tinged with blood and devoid of mucus, the treatment should not be begun with a dose of oil, but with the morphia and soda mixture. This should be persisted in unless there is fever. Did that set in, about one-half the quantity of castor-oil recommended might be given; and this dose be repeated in three hours if the first had not improved the character of the discharges.

When vomiting occurs it should be treated as advised in diarrhœa.

Were failure of the strength rapid, alcoholic stimulants would be indicated, and brandy, for instance, should be given in tablespoonful doses to the largest breeds; one-half this quantity to those of medium size; one-fourth to fox-terriers and the like; and one-eighth, or one-half a teaspoonful, to small toys.

Stimulants of this character should be mixed with a little milk and the white of eggs. But only rarely will it be necessary to use them; and in the extreme cases in which they appear to be indicated, he is wise who seeks the advice of his physician.

The diet should be the simplest possible, as advised in diarrhœa.

ENTERITIS.

Enteritis or intestinal catarrh is an inflammation of the bowel, and particularly that part of it known as the small intestine, although it sometimes extends over the entire alimentary canal. It may also be limited to the mucous membrane which lines the intestine and glands therein, or it may go deeper, and involve the whole intestine from its inner to outer surface.

Many of the influences that excite diarrhœa are capable of causing enteritis. It is also sometimes met with in chronic diseases of important organs, as the heart, kidneys, and liver; and frequently it is associated with distemper. Again, it is liable to set in during the course of any fever that is dependent upon germs or special poisons. But aside from cases in which it occurs as a complication of distemper, it is not common in mature dogs. Very young puppies, however, are frequent victims; and most often in them the trouble is induced by worms or unsuitable dietary.

Looseness of the bowels is the earliest and most constant symptom; and while the intestinal trouble is an irritation merely, the affection is simply diarrhoea; but true inflammation having set in, it becomes enteritis. Vomiting may also be an early symptom. Although in some cases it occurs only occasionally, in others it is frequent and persistent; and in these, as a rule, the stomach is involved in the inflammation, and the attacks are really gastro-enteritis.

Pain is rarely absent, although in the early stages it may be of mild character and escape detection. Very generally it is of colicky nature at first, and after a time becomes unremitting and a steady "ache," which is intensified by pressure. The abdomen is usually distended; its walls are firm, hard, and tightly drawn; and unless the distention is very considerable, when standing the back of the sufferer is arched, and his tail pressed tightly between his legs, as in severe colic.

The foregoing symptoms are generally attended by fever, which varies at times in intensity, being now scarcely noticeable, and again quite evident; but seldom, however, does it run very high. As always when fever is on, the skin is dry and the pulse quickened. There is also thirst and loss of appetite. While the pain is colicky the patients are restless, but they are comparatively quiet when it is dull and persistent. Another characteristic symptom appears in the tongue, which is glazed and has the appearance of raw beef. Still another may sometimes be presented by the opening of the bowel, the lining of the same appearing of a very deep red color, hot and dry.

These are the common symptoms of this disease, and from what has been said of them a general idea can be acquired of their intensity. In some cases not only are they very pronounced but others are added, as painful straining when discharges from the bowels occur, and tenderness of the abdomen so great that the sufferer can hardly be persuaded to move, and he moans and cries out if forced to do so. In such cases, also, the breathing is hurried and evidently painful, the victims seeming to avoid deep inspiration. Again, in very grave forms of the disease there may be constipation, and diarrhoea only occurs after the danger has past and convalescence commenced.

Obviously the chances of recovery depend largely upon the cause; and where it can be removed speedily they should ordinarily be good. Moreover, they are greatly influenced by the severity of the disease and the length of time it has been on; also by the strength of the patient. Considering all cases, where it occurs singly and not as a complication, only a small per cent die; but including those in which it is associated with other diseases, and notably distemper, it is serious, and adds much to the dangers of a fatal termination.

The affections with which enteritis is most likely to be confounded are diarrhoea, dysentery, colic, poisoning by irritants, and peritonitis.

But the first named is far less serious and not attended by such constitutional signs as fever, great thirst, prostration, etc.

In dysentery the discharges contain blood and there is severe straining, whereas in enteritis blood is but rarely seen in them.

Colic is a functional trouble in which the pain is intense; it is not, however, attended by fever or other inflammatory signs, and sufferers from it are oftener troubled with constipation than with diarrhœa.

In poisoning by irritants, as arsenic and other chemicals, the vomiting is much more severe and persistent than in enteritis. While there is usually diarrhœa in such cases, it is seldom an early symptom, and, as a rule, does not appear until a day or two after the evidence of serious gastric trouble is manifested.

As for peritonitis, that is a grave affection from the first. It comes on very rapidly, and at the onset the abdomen is more or less distended; whereas enteritis is comparatively slow in developing, and generally its victims are ailing two or three days before it is fairly on. Again, in peritonitis vomiting is not a common symptom, especially during the first days. Still again, constipation is the rule in peritonitis, and diarrhœa the rule in enteritis. Finally, while in occasional cases of the latter the victims are manifestly very ill, it is only after the disease has been running several days; on the other hand, in peritonitis the outlook is grave from the first.

The treatment of this affection is much like that of diarrhœa of severe form, — a cathartic first, and then opiates. The use of the former has been condemned in toto by some authors. Of course were the bowel perfectly empty, and that fact plainly evident, it assuredly would not be necessary to give oil or other like-acting drug; but considering the quite invariable uncertainty, at least in the earliest stages, it is safer to assume that there are irritating substances in the intestine, consisting of only partially digested foods, perhaps, or fecal accumulations, which, if allowed to remain, must excite and keep up the inflammation, also give rise to violent peristalsis or intestinal motion, thus preventing rest, which is so important to inflamed parts. Indeed, the all-important requirement in dealing with inflamed and possibly ulcerated surfaces here or elsewhere is to secure rest and protection from irritating substances.

Therefore, unless the attack has existed for several days, and during that time there has been profuse diarrhœa, the first measure of treatment to be applied is a good dose of oil. If, however, the discharges have been many and copious, it may be advisable to withhold the oil for a time and depend upon the opiate treatment.

Castor-oil might be used, but olive-oil or salad-oil acts decidedly better. The dose of this should be a generous one; and for a dog of medium size or of the largest breeds, a large breakfast cupful would be none too much. About half that dose should be given to dogs about the size of fox-terriers; while one-fourth would be right for toys.

If the first dose of olive-oil fails to act, it should be repeated in the course of eight or ten hours.

When the caretaker is in doubt as to whether or not the oil should be given, it would be better that he assume the affirmative. But instead of administering it by the mouth, he should inject the same quantity into the bowel; and to repeat such injection of oil at intervals of from twelve to twenty-four hours would be advisable, until the patient was decidedly better.

When the first dose of oil taken is by the mouth, it would be wise to afterward administer injections of the same at the intervals stated, and until improvement is evident; for by this means the inflamed bowel will be kept continually free from all irritating particles, and at rest.

Aside from acting well locally in such cases, olive-oil has a very decided effect upon some of the constitutional symptoms, especially the fever, which if high it speedily reduces, and generally keeps down as long as the injections are persisted in, and accumulations of irritating substances are thus prevented.

In every attack of enteritis an opiate should be given at regular intervals, from the first; and laudanum, the dose being graduated as in colic, suggests itself as the most convenient. As to the frequency of the doses, that must depend upon the intensity of the pain. Ordinarily once in two or three hours will be near right.

The subnitrate of bismuth promises quite as well in enteritis as in diarrhoea, consequently it should be given continuously as advised for the latter, whether or not there is vomiting.

In the matter of diet, manifestly only those articles that are easily digestible should be chosen; and milk, raw eggs, scraped raw beef, and meat jellies are eminently suitable.

In fatal cases of enteritis in puppies, caused by worms, it is generally found that the inflammation is not diffuse, but occurs here and there along the intestine, in quite large patches, with surfaces between each that are unaffected or merely irritated.

The removal of the troublesome tenants is, of course, the first indication. A vermifuge having been given, the inflammation if slight should subside without treatment. But where the puppies are very young they soon succumb to disease, consequently it is scarcely safe to long rely wholly upon nature to effect a cure; and if the discharges do not speedily improve in number and character, remedies should be addressed to them. Those recommended for diarrhoea are eminently suitable; indeed, the treatment of enteritis in puppies is identical with that required in diarrhoea of severe form.

Of course if worm medicine has been given and been followed by castor-oil, a dose of olive-oil by the mouth will not be required; but if the patients are matured dogs or quite old and hardy pups, injections of it may be subsequently administered. In enteritis occurring in very young puppies from other causes than worms, olive-oil may be given internally under the conditions set forth in the foregoing; but injections of it cannot be advantageously used with them.

CONSTIPATION.

During the first days of a fever of any kind constipation is the rule, although in occasional instances diarrhoea occurs. The former is then purely a symptom, and the essential treatment but a part of that required by the existing disease. Herein, therefore, it will be considered only as an independent affection.

It has a great variety of causes; and since many of them are identical with those that act in the same way among members of the human family, and with which all must be quite familiar, it is merely necessary to dwell on the influences which generally give rise to the affection in dogs.

The first appears in the diet when it consists largely of substances which are capable of being absorbed into the blood, and leave but little to pass out by the bowels. For example, a dog fed almost wholly on meat would not have near the usual amount of refuse; or, strictly speaking, he would naturally be costive, this term meaning that not only are the movements less frequent than natural, but of less amount. And the effect would be the same were he denied sufficient food.

Another common cause is deprivation of sufficient pure, fresh drinking-water, in consequence of which the blood in some degree is lacking in this very essential constituent, the secretory action of the glands of the large intestines is less powerful than it ought to be, and there is an over-dry state of the lining membrane throughout the bowels. As a consequence of all this the fecal matter is dryer and harder, and its expulsion more difficult.

Lack of sufficient exercise is another cause of constipation; indeed, lazy indoor pets are especially prone to the affection. But with them there are doubtless other causes equally active, and notably neatness and restraint; their outings being dependent upon the convenience and caprices of their owners rather than their own wants. And if nature's promptings are continually disregarded or resisted, the inevitable result is a lessening of the sensibility of the lower bowel, also of its contractility and expulsive power; and the constipation in corresponding degree becomes more pronounced and unconquerable.

A uniform and unvaried diet, day after day, tends to impair the activity of the bowels. So, too, the habitual use of very coarse foods; the bowels becoming fatigued, as it were, by the continued strain or effort made to expel so large a residue.

It is only within the last decade that physicians have duly appreciated the possibilities of self-poisoning, and the frequency with which it occurs. For instance, food substances that are ordinarily easily and well disposed of, under certain conditions and in consequence of impairment of some one or more of the organs concerned in the process of digestion, may undergo deleterious changes,

and the poisons be absorbed and seriously affect the entire system. Constipation furnishes another illustration of self-poisoning. Let the refuse be too long retained in the upper parts of the large intestine, and not only is its fluid portion largely absorbed and taken up by the blood, but there is likely some absorption of the poisonous solids as well. And hereby is explained many instances of so-called "biliousness," that are characterized by loss of appetite, foul breath, languor, etc., the same being merely cases of self-poisoning attributable to imperfect action on the part of the bowels.

As a rule, the remedy for constipation should be in the feeding-pan. Assuming that the diet consists principally of meat, substances which furnish a large amount of refuse should enter into it in goodly quantity; and of these such vegetables as cabbages and the so-called greens—spinach, dandelion, nettle-tops, beet-tops, and the like—are the most serviceable. Certain breads also act well in the same way; the coarse qualities, which contain the bran, tend to prevent clogging, keep the bowels active, and assist in the assimilation of other foods. On the other hand, the popular "white bread" made from fine wheat flour favors constipation.

The various meals, as Indian, also have a beneficial action on a sluggish bowel, provided always they are not given in excess. Indeed, let a dog affected with constipation be fed on, say two parts meat, one part Graham bread, or one of the meals, and one part vegetables, unless they are diseased, his bowels should come right. But of course it may be necessary to increase or decrease from time to time the proportions of these laxative constituents, as their action is deficient or excessive.

Exercise has rightly been termed the "grand eliminator of waste," and without it not only the bowels but all other excretory organs are more or less indolent. Consequently this simple remedy must be applied in goodly amount in every case of constipation.

As implied in the foregoing, dogs should always be well supplied with pure, fresh drinking-water, for otherwise not only are their bowels likely to be sluggish, but their general health must be impaired. In truth, under the deprivation, nutrition can never be good; the victims invariably lose flesh, fall off in coat, and sooner or later suffer from disease, which as a rule first attacks the skin.

While habitual treatment should consist of dietetic and hygienic measures, oftentimes it will be necessary to at once relieve the constipation, and in such instances medicines must generally be given.

Of the many remedies of this nature castor-oil is the most popular. It is certainly efficient, but there are some objections to its use except in selected cases, and sweet or olive-oil, alone or with an equal quantity of the syrup of buckthorn, acts quite as powerfully, and leaves the bowels in rather better condition.

The syrup of buckthorn is rightly highly esteemed as a cathartic. Combined

with sweet oil, a tablespoonful of each may be given to dogs of large size. Double that quantity of the buckthorn might be given if used alone, and brisk and free action is desired.

In attacks of sickness in which there is fever it is generally advisable to unload the bowels, and then calcined magnesia acts well, either alone or combined with powdered rhubarb. The dose of the former is a full teaspoonful for large dogs; and if a good purging is deemed necessary, with it should be mixed nearly half a teaspoonful of the latter.

Among the purgatives in pill form the so-called compound cathartic pill is as good as any if the bowels are not irritated; and three for dogs of the largest size, two for the medium, and one for fox-terriers and the like, are suitable doses. As for the smallest toys, magnesia is the best for them.

In occasional cases the retained refuse is so dry and hard, that cathartics are very slow in having their effect; and in such, also in every instance in which it is desirable to have the bowels move at once, an injection should be given. For the purpose a simple and efficient mixture may be made of strong soapsuds and water, to which has been added a teaspoonful of molasses and the same quantity of table-salt. As an injection, sweet-oil also acts speedily and well when generous quantities are used. A cupful would be none too much for the largest breeds. Another efficient remedy is glycerin, of which only a little need be injected to move the bowels, — from a teaspoonful to a tablespoonful, according to the size of the patient.

CHAPTER IV.

INTESTINAL OBSTRUCTION.

In this instance obstruction signifies not merely constipation but an accident which as a rule proves exceedingly dangerous.

Considering the fact that dogs are accustomed to swallow hair, bits of wood, glass, stones, and other indigestible substances, stoppage would seem likely to occur often among them; yet as a matter of fact it is not common, thanks to the provisions of nature, which make it possible for almost anything that can pass through the throat, to journey down and out of the alimentary canal. The exceptions to this are few, and include substances that have sharp points, which obviously render them liable to become fixed on the way.

But there are other causes of obstruction. Sometimes it results from a twist or knot in the intestine. Sometimes, also, it is occasioned by what is termed intussusception, which is the slipping of one portion of the intestine, stove-pipe like, into another, in which case the outer part contracts and holds the inner fast.

By strangulated hernia is meant the imprisonment of a part of the bowel in an opening in the abdominal wall, which constitutes what is popularly called a "rupture." In umbilical hernia, for instance, the bowel produces the characteristic appearance; and generally the knob-like protrusion yields to pressure, and can be forced back. As long as this is possible there is no obstruction; but if the tissues which constitute the hernial ring become inflamed or affected by spasm, the opening is narrowed, the intestine pinched, and passage through it obstructed.

Obstruction may occur in consequence of pressure from tumors, also organs that are greatly enlarged by disease. Again, it may be the result of long-neglected constipation, matters that should be thrown out accumulating and forming a mass which the lower bowel has not the power to expel. Finally, cases of obstruction are encountered in which the cause cannot be determined.

Only by the selection of a typical case of intestinal stoppage for an illustration can an adequate idea of the symptoms be conveyed. Pain is usually the first manifestation sufficient to attract attention, although in some instances an insignificant diarrhœa or constipation may have previously existed. The pain is severe, colicky in character, and recurs at short intervals. Indeed, the symptoms at this stage are identically those of colic, for which obstruction is commonly mistaken and treated.

For convenience it is presumed that, under the impression that a free passage of the bowels would bring relief, both a cathartic and an injection have been administered. But success has not attended the use of these remedies ; the bowels have not moved, or have had only slight action, the pain persists in all its intensity, and vomiting is frequent. The abdomen is much distended, the expression piteous and anxious, and the eyes congested and sunken. The respiration is superficial and hurried, and the pulse small and rapid. At times the sufferer is irritable and snarling, at others, dull and apathetic. He makes frequent attempts to empty the bowels. These efforts are painful, and the suffering is increased by failure to purge. At first the vomited matter is composed of the contents of the stomach ; then it is greenish ; later a dirty green ; next it has much the appearance of diarrhoeal discharges ; and finally, if life is prolonged, refuse which would naturally have been thrown off by the bowels appears in the matter vomited, with its characteristic fecal odor. Now the poor dog is in a condition of collapse. His skin is cold and clammy, vomiting is frequent, breathing rapid, thirst great, pain exhausting, eyes are leaden, tongue dry and covered with dirty brownish coat ; while the pulse, previously thin and thready, is no longer felt ; and death closes the scene.

These are the symptoms present in a typical case of intestinal obstruction that speedily proves fatal. But typical cases of any disease are far from common, therefore no one should expect to find the lines drawn as distinctly as here. In all instances, however, where the stoppage takes on, as it were, a rapid course, the resemblance between its symptoms and those described should be too great to be mistaken.

When the stoppage is complete, dire results soon follow ; but this accident is not nearly so common as partial stoppage, which is the rule where the obstructions are bones, woody fibres, and the like. In such the symptoms which point to the real trouble may be delayed until the offending substance has reached the lower part of the bowel and is about to be expelled.

For instance, a dog swallows a very hard bone of large and peculiar size. For perhaps a week he may appear as well as usual, and then take a bad turn, lose his appetite and spirits, fall off in flesh and strength, and in the meanwhile suffer from constipation. Erelong the trouble seems to be diarrhoea ; next the symptoms presented suggest dysentery as the existing affection ; there being frequent and scanty discharges containing blood, and attended by painful straining. The offending bone is now in the lower bowel.

Obviously, previous to this final stage it would not be easy to determine the nature of the existing trouble.

Fortunately bones are not often the cause of intestinal stoppage. They are of course very hard to digest ; and the operation is slow, for it is confined to their surfaces, where the lime-salts are acted upon and dissolved. With strong digestive powers a dog may be expected to dispose of all bones he may swallow ; but

suffering from impairment, sharp splinters of very hard bones might remain undissolved, and cause much disturbance.

Where the stoppage is complete, or nearly so, and the sufferer fails rapidly, it is possible to mistake the cause and assume the case to be one of poisoning by arsenic or other irritant poison; but a careful comparison of the symptoms presented in both accidents should prevent confusion, at least after the first few days.

Many of the symptoms of peritonitis resemble those of stoppage, but in the former, vomiting is rarely frequent until late in the disease; moreover, there is not that unyielding constipation that exists in stoppage. Again, the signs of great constitutional disturbance, as high fever, rapid and weak pulse, etc., are manifested early in peritonitis, but late in stoppage. Finally, the victims of the former are apparently very sick from the first; whereas the symptoms manifested by those suffering from the latter only gradually become threatening.

There remains one sign that occurs in quite a large proportion of cases of stoppage; namely, the formation of a swelling or tumor in the abdomen. When this is noted with the symptoms already described there is scarcely room for mistaking the true nature of the existing trouble.

Stoppage which gives rise to the most threatening symptoms, and is indeed the most dangerous, as a rule, is high up in the intestines. Death seems imminent then, yet as long as there is life one may feel hopeful; for in some of the most desperate cases the obstruction has suddenly given way and recovery occurred.

The cause of the stoppage being a splinter of bone or other foreign substance, and that having reached the lower bowel, as one can rightly assume to be the case when the discharges contain bright red blood and are attended by very evident pain and much straining, it may be accepted that the chances are many that it will be safely expelled.

In this connection it is well to call attention to the fact that where the obstruction is low down the abdomen is generally much more distended with gas or wind than when it is high up. To this, however, as to all other rules, there are exceptions.

The existence of intestinal obstruction is scarcely likely to be determined until after purgatives have been given. These having failed, warm water may be injected slowly into the bowel until it runs away. The effect of such injection is relaxing, and it may be decidedly beneficial, but unfortunately that is the case only in rare instances.

Once the symptoms point to stoppage, the sufferer should be kept very quiet and given opiates, as directed in cases of colic. If they seem to indicate that the obstructing body is in the lower bowel, an injection of sweet-oil will be advisable. The oil should be warmed, to enable it to easily pass through the syringe; and it ought to be carried as far up as possible by means of a piece of rubber tubing drawn over the nozzle of the instrument. Convenience suggests

that this tube be from one and one-half to two feet long where the patients are of large size, and it may be about the diameter of that on an ordinary "bulb syringe." Its introduction when slow and accomplished by constantly turning — boring it in as it were — should be easy and painless; and it should be persisted in until it tends to double on itself, thereby showing that it can go no farther. As for the quantity of oil to be used, the basin holding it should contain fully one pint; and the oil should be injected until it runs out around the tubing. Such injections also should be repeated from time to time if they seem to lessen the straining.

This so-called rectal tube might, by the way, be wisely employed invariably where injections are given in cases of suspected stoppage, whether the fluid used is sweet-oil, glycerin diluted with ten or twelve parts of water, soapsuds, or of other character; and there are chances that if the injection can be made deeply enough the intestine will relax and the obstruction yield.

In all like cases also it were advisable to methodically knead the patient's abdomen, and thoroughly manipulate it from below upward.

Considering the diet, raw eggs, meat juices, extracts or jellies are indicated, and should be given as the conditions will allow.

Summarizing: The essentials in treatment are rest for the victims — to be secured by opiates — and support; the aim being to keep up the strength, with the hope that the obstruction will eventually yield.

As no more favorable opportunity is likely to be presented, it is well to consider here the treatment which should be applied where it is known that substances capable of causing obstruction are swallowed. But before doing so, a description of a case reported some years since will be instructive.

It was of a dog that had swallowed a silver dollar. "Emetics of every description were administered in the hope of recovering the coin in that way, but it failed to make its appearance after the most strenuous efforts to dislodge it." Some five months after the accident, the victim, in the meantime having been fairly well, suddenly took on a bad turn, failed rapidly, and soon death seemed imminent. His chain having been removed that the end might be easier, the poor fellow staggered to a grass-plot in front of his kennel, lay down, and began to eat. After a time his caretaker, thinking himself mistaken, and that life would linger another day, sought to chain him again. He showed very evident reluctance at leaving the grass, therefore a "large double handful" was gathered and deposited at the door of his kennel. Some hours later it was found that he had eaten it all, and his condition had apparently been made worse. Early the following morning, however, it was discovered that a very happy change had occurred during the night; and this was accounted for by a bunch of grass, all covered with slime, in the centre of which lay the offending coin, now badly discolored.

Such accidents as this are not likely to be discovered early enough to

permit of the application of a treatment which promises success, but still it is well for the owners of dogs to know the best measures to employ.

For the removal of foreign bodies from the stomach, physicians are now recommending the eating of potatoes only, in large quantities, cooked in different ways, to stimulate the appetite. Cases are on record in which articles of jewellery, brass weights, nails, pins, etc., were successfully ejected after a few days of this potato diet. Even sets of false teeth, long needles, and pencils have journeyed through the intestinal canal of man and yet done no harm. It is reasonable to infer from this that some such treatment should be applied to the dog that has shown such a perverted appetite. He would scarcely be content with a potato diet, and yet he might if finely chopped meat were added. A surer treatment, however, would be to administer flour paste as soon as possible after the foreign body had entered the stomach. Simply flour and cold water is all that is necessary; and the mixture requires to be as thick as possible and yet flow out of the dish in which it is prepared. About two cupfuls of this should be poured down the dog's throat. The water will soon pass out of the stomach and leave the flour to coat over and incase the offending substance.

Water should be entirely denied for at least twelve hours, and during the next day or two be given only sparingly. After that a potato diet, rendered appetizing by meat, should be persisted in; and a cupful of flaxseed tea—made quite thick—be administered every two or three hours.

On the third day a dose of castor-oil may be given; but it should be merely sufficient to produce a laxative, not a cathartic, effect.

In the case related, the dog instinctively applied the best possible treatment, and essentially the same as that herein advised. The grass acted as would the flour-paste or potato. Doubtless owing to its shape, the coin could not pass certain points in the stomach or intestine, but when enveloped in grass, and practically converted into a ball, it made its way easily.

Elsewhere, under the head "Abdominal Surgery," the wisdom of surgical interference in cases believed to be of intestinal stoppage has been considered; and herein it is merely necessary to call attention to the fact that in all attacks, of whatsoever nature, in which the abdomen is greatly distended by gas, as in stoppage, and intense pain is caused thereby, the gas should be expelled, and prompt relief afforded by plunging a fine trocar and cannula through the abdominal walls, over and into the distended bowel. Or in the absence of such fine instrument, the surgeon can generally use successfully the needle of his hypodermic syringe, if the same be a long one, and the abdominal walls are not too thick. And were that or other suitable instrument not obtainable and the case very desperate, the writer would not hesitate to use the fine blade of his pen-knife.

DISEASES OF THE LIVER.

The liver of man is an abused organ, and accused of much for which it is nowise responsible. This is largely accounted for by the fact that ignorant and unscrupulous pretenders to medical skill have long been accustomed to use the terms "liver complaint" and "biliousness" in cases the nature of which they knew nothing, and in which, in most instances, the real trouble was far removed from the liver. In consequence laymen are wont to assume that when they are ailing from unappreciable causes this organ needs stimulating, and therefore "Liver Pills," "Pads," "Invigorators," and "Tonics" are the most popular nostrums of the day, and must continue to be so as long as easy gullibility is such a pronounced characteristic of mankind.

He who is temperate, lives outside of malarial districts and low, damp, and intensely hot regions, seldom suffers from disease of his liver ; and if reasonably discreet in his habits, it is but rarely deranged. The liver of the dog is even less liable to disease and derangement, for its resistance as well as capabilities are greater, and influences which might upset his master's liver could scarcely have any effect upon him.

As a matter of fact, in his kind this organ only rarely requires interference ; but since it is not entirely exempt from trouble, it cannot rightly be ignored altogether, therefore the infirmities to which it is liable will be briefly considered.

CONGESTION OF THE LIVER.

When denied sufficient exercise and yet generously fed, dogs are liable to be victims of congestion of the liver ; and these conditions are especially productive of that disturbance during hot weather. It may, however, be caused by "catching cold," also by errors in diet which give rise to indigestion. At times it is present during the run of inflammatory affections ; and it is quite likely to occur in diseases of the heart and lungs, which interfere with circulation and cause the vessels of the liver to be over-filled.

In this affection the liver is usually enlarged ; and there is some shortness of breath when the enlargement is considerable. A furred tongue, constipation, lead-colored discharges, bad breath, now and then yellowness of the eyes, and some tenderness on pressure in the region of the liver, are the most constant symptoms.

Unless caused by other affections, and the same are still existing, treatment requires merely a light diet from which fats are excluded, perfect freedom of movement if possible ; and if not, then ample exercise, and medicine to act

gently on the bowels. Magnesia well meets the requirement. It should be given twice daily while the stomach is empty, and be persisted in for a week or more if necessary. Two or three discharges each day, the same being semi-fluid, will be right. Neither calomel, blue-pill, nor other mercurials are required when the diet is properly regulated.

INFLAMMATION OF THE LIVER.

When the stomach and intestines are inflamed there may occur, in sympathy as it were, an inflammation of the liver, which physicians term hepatitis. This affection may also follow congestion, and it may come on alone.

Two forms are recognized, the acute and chronic; but both are exceedingly rare, and the former is scarcely ever found except in very hot countries, in which the liver appears to meet conditions that are anything but congenial.

The symptoms are much the same as those of congestion, only the sufferer seems worse, and there is greater tenderness on pressure on the right side, under the lower ribs. Vomiting and diarrhoea may also be present, induced by the irritant quality of the bile, while fever is a constant symptom in severe attacks. The manner of the patient is also suggestive. He becomes dull and listless soon after his liver is attacked; but at times is very restless, evidently in consequence of pain. The position that he assumes on lying down would point to the liver, it being on his chest and abdomen, or his right side, never on his left. And when he gets up, he moves as though stiff and lame.

Jaundice is rarely absent where there is much inflammation of the liver, and as a rule it appears within four days after the first symptoms are exhibited. That present, the pulse, previously full, bounding and rapid, falls below the normal.

The course of acute inflammation is usually rapid, and may either terminate in recovery, resolve itself into the chronic form, or eventuate in abscess. In the latter instance death is quite sure to occur; and before it comes, a swelling over the region of the liver can generally be made out. A fatal end nearing, there is rapid emaciation, together with the usual signs of failure and exhaustion. The breathing is hurried, and the abdomen assumes the appearance of pregnancy.

The "let-alone treatment" is much the safest and best in this affection. That is, withhold medicines, make the sufferer as comfortable as possible by judicious nursing, support him well by simple and easily digestible foods, and leave the rest to nature.

Chronic hepatitis might follow the acute but it seldom does so; and very generally it springs from causes which act so slowly and insidiously that their character cannot be determined. Its victims are nearly, if not quite, all old

dogs whose lives have been indolent and luxurious. As a rule, its existence is not suspected until well advanced and enlargement of the abdomen has occurred. Previous to this the appetite is impaired, the manner of the victim dull and sluggish, and there is progressive emaciation, which, associated with the enlargement, is strongly suggestive of the nature of the existing illness. In the majority of cases, eventually the tongue is nearly white, and at the same time the mucous membrane of the mouth and lips loses its healthy color and becomes pale and yellowish. Jaundice is also noted in some cases, but only rarely is it very pronounced. The breath is usually offensive, and the eyes are dull and lustreless. Vomiting is frequent, the matter ejected being greenish. There is a tendency to constipation, with occasional diarrhoea; and the discharges are commonly clayey. The kidneys are indolent, and the urine scanty and high colored. As emaciation progresses, the skin thickens and becomes rough and scaly, and the hair dry and staring. Until the abdominal distention is sufficient to mechanically interfere with respiration, the breathing is unchanged. The pulse also varies but little until late in the disease. In certain cases, instead of being enlarged, the liver is reduced in size, and the abdominal distention which then occurs is due to dropsy, while in most instances the extremities become dropsical as the fatal end is approaching rapidly.

These symptoms nearly all point so directly to the liver that there is scarcely a possibility of mistaking at least the seat of the trouble; and since in all instances in which dropsy is due to disease of that organ a cure is well nigh out of the question, it is not necessary to go into the means by which a positive diagnosis can be made.

The malady is relentless; and if the desire is to prolong life, good management in feeding, etc., must be the reliance.

FATTY LIVER.

When animals become obese, fat is deposited in the various organs as well as in the tissues of the muscular system. In the liver this condition is termed fatty infiltration; and if it is not corrected in time there is destruction of the liver-substance, which process is known as fatty degeneration. During the infiltration there is practically merely a storing away of fat in the liver-tissues, in consequence of which the affected organ becomes enlarged; but during degeneration there is atrophy, or in other words, a decrease in size.

Fatty infiltration may be a part of general obesity; it may also be in consequence of habitual deprivation of sufficient exercise, or of over-eating, especially of foods that are too rich in fats or in fat-producing substances. It also sometimes occurs in wasting diseases.

The causes of fatty degeneration seem more varied. Following fatty infiltration it may be attributable to the same influences. Certain poisons are also capable of producing it, notably arsenic. It may occur as a complication in acute infectious diseases of very severe type and long and tedious run; while now and then it has appeared to be a sequence of pernicious anæmias or grave cases of poverty of the blood.

In cases of general obesity, in which the liver is found to be enlarged but serious symptoms are absent, it will generally be safe to assume that the hepatic trouble is infiltration merely. If, on the other hand, the liver be reduced in size, and there is jaundice, occasional vomiting, and loss of strength, the digestive organs are habitually disordered, the victim, formerly obese, is now near or below the normal weight, and there is dropsy, the chances are many that his trouble is degeneration. But it is only in advanced and severe cases that important symptoms are manifested, hence a diagnosis is never likely to be made early, and while treatment could have good effect. As for the essential treatment of fatty infiltration, obviously it is largely a modification in diet, which mainly consists of giving only sparingly the breadstuffs, various meals, potatoes, and other so-called starchy foods, which are notable fat-producers, and increasing the proportion of lean meat and vegetables that grow above ground. It is highly important also that ample exercise be encouraged.

CHAPTER V.

AMYLOID LIVER.

IN very rare cases there is a deposit in the connective tissues of the liver of a peculiar substance having some of the reactions of and resembling starch. The liver is then said to be the subject of amyloid infiltration.

The organ is increased in size and of firmer consistency. Its edges are rounded, and the surface is of light color, presenting in some instances a mottled appearance.

Amyloid infiltration may occur primarily in the liver; but it is often a part of a similar change going on elsewhere in the system, and affecting especially the spleen and kidneys. It has also been attributed to peculiar changes in the blood, and to certain exhausting constitutional diseases.

Among the symptoms presented are those manifested by gastric and intestinal disturbance, abdominal enlargement, capricious appetite, constipation, and great falling off in condition generally. But rarely, however, are they sufficiently distinctive to enable a diagnosis to be made.

A cure is out of the question, although a gain is possible. It were, therefore, useless to discuss treatment.

CANCER OF THE LIVER.

Only a very few cases are on record in which malignant growths have formed in the livers of dogs; and nearly all, if not all, of the victims had reached old age. It appears to have been the rule also that the cancerous changes in the liver were of secondary occurrence, some other parts of the body having been first attacked by them.

Such changes are characterized by digestive disturbances, loss of appetite, diarrhoea alternating with constipation, progressive emaciation, a general breaking-down of the system, abdominal enlargement, possibly jaundice, and the appearance of nodular masses, — bunches, irregular enlargements, or tumors. These may occur singly, or the whole liver be studded with them.

Cancerous deposits are of two varieties; namely, the hard and the soft. With either the liver is usually slightly increased in size. The presence of the

former variety can often be made out, the hard tumors being felt through the abdominal walls ; but the other form can rarely be detected during life.

Treatment can have no other result than palliation merely.

BILIOUSNESS.

The term biliousness is of vague meaning, and so often is it misused, it ought to be expunged from the medical vocabulary. But still, its use has so long been widely prevalent, it can scarcely be ignored now, and the conditions to which it is generally applied must be briefly considered.

The disorders of the liver which might possibly without impropriety be included under this head have been defined in the discussion of diarrhœa ; but it is only comparatively rarely used with them, and in most cases subjects are termed bilious when they are suffering from indigestion merely, or from a disorder induced by poisons generated in foods while undergoing digestion.

The symptoms of biliousness from these causes are foul breath, capricious appetite, furred tongue, dinginess of the whites of the eyes, a hot nose, and dulness and lassitude. The manner, however, generally speedily brightens under excitement. Constipation may also exist for a time, to be followed by diarrhœa.

These symptoms in some instances last only a day or two, while in others they are prolonged several weeks ; in which case the coat loses the gloss of health and becomes lustreless and rough, and very often the sufferers are victims of eczema.

The so-called starvation treatment is the proper one to apply in cases where this trouble has just set in. That is, to either withhold food altogether for two or three days or limit it to very small quantities, and always to the simplest and most easily digestible articles, as milk and lime-water, skimmed milk or butter-milk, or thin beef-teas. But aside from dietetic restrictions, it will generally be advisable to administer a cathartic ; and it matters little which of the drugs that act as such is chosen.

As for cases of long standing, to give skimmed milk for breakfasts, and only one hearty meal daily, at night, should be the rule. This should consist of meat, green vegetables, and Graham bread, crackers, boiled rice, or other light starches. At the same time ample exercise should be allowed.

JAUNDICE.

Jaundice, sometimes called yellows, is not a disease in itself, but is due to the circulation in the blood of elements of the bile, sufficient in quantity to

color the skin and "whites" of the eyes. And this stain may be from a faint yellow to a bronzed or greenish brown.

In most instances the urine is very high colored, and certain secretions are similarly affected in severe cases. Discharges from the bowels may also be distinctly changed in appearance, and notably when the bile is prevented from leaving the gall-bladder; they being then pale, clay-colored or slate-colored, and dry, hard, and lumpy. At the same time the bowels are sluggish, and there is constipation, owing to the absence of bile.

Speaking generally, there are two conditions which may give rise to this affection. In one, the liver does not remove the coloring-matter from the blood, and the same finds its way out largely through the small blood-vessels at the surface of the body. In the other, the liver does this properly, but being prevented from passing into the intestine, the bile is reabsorbed.

Of these conditions the latter is by far the most common; and the obstruction in the gall-duct—the passage from the gall-bladder to the intestines—is, as a rule, due to inflammation of its lining membrane, which, swelling, closes the canal. The inflammation here only rarely has its origin in the gall-duct itself, but in most instances it is an extension of a similar trouble from that part of the intestine into which this duct opens.

As for the intestinal inflammation, its causes have already been discussed under Gastritis and Enteritis. But it may be merely circumscribed, that is, confined to only a small part of the intestine near the duct in question; in which instance it is often caused by a foreign body, as a small stone, or it may be associated with obstruction of the bowel.

In all diseases of the liver jaundice is likely to occur, yet it is a significant fact that generally they must be quite serious and have persisted for a considerable time before this symptom is prominent. It would also seem from results of observations that, contrary to the general belief that the liver or some of its attachments are invariably at fault where there is jaundice, this trouble may exist and yet, as far as can be determined, the liver be in a perfectly healthy state; showing that the cause may be beyond it and in some other part of the system.

Jaundice is a frequent complication of distemper. It has also been variously attributed to chilling, errors in feeding, and especially to decomposed meats, excessive fatigue, obstinate constipation, filthy surroundings, intense excitement,—as experienced in fighting,—kicks, blows, etc., all of which influences would seem capable of exciting it under certain conditions. Again, it may be caused by the pressure of tumors.

Occurring as it has in epidemics, several inmates of kennels being attacked at the same time, some hold to the theory that, in occasional instances at least, it is of infectious nature. This, however, has not been proved; and, indeed, the weight of evidence is much against it.

There is still one more way in which the trouble may be produced; namely, by obstruction of the gall-duct by a plug of thickened bile, worms, or gall-stones. This accident, however, is not of frequent occurrence.

The yellowish stain in the eyes is unmistakable evidence of the affection. For a short time previous to its appearance, and while the liver trouble continues, the victims are usually low-spirited, languid, sleepy, and averse to exertion; they appear cold and shiver, there is a disposition to scratch, the pulse falls below the normal, the temperature rises possibly two or three degrees, and the functions of the body generally seem torpid.

These symptoms are attributable to the bile in circulation, which doubtless has a narcotic effect upon the nervous system; and when the same is pronounced, the respiration becomes less frequent, the appetite is capricious or disappears, thirst is excessive, and vomiting frequent; as a rule the matter expelled being greenish.

Pain of colicky character is commonly present, and when so the abdomen is hard and back arched. Dryness and usual heat of the nose, mouth and breath are also associate symptoms.

The bowels are usually constipated until towards the last of the trouble, although diarrhœa may occur early, and the discharges are of diagnostic significance. For instance, if they are clayey, it is evident that bile is entirely shut off from the intestines, whereas if they approach the color of health, the obstruction to its flow is only partial.

Finally, the urine contains bile if the usual quantity does not enter the intestine, and it is so high colored that it leaves a decided stain when the jaundice is intense.

Nutrition may for a time be but little affected; but if the trouble persists, the coat loses its glossy look and becomes dry and staring, and emaciation is rapid.

Generally the symptoms described come on insidiously, and slowly grow more pronounced; but now and then the disease runs a very rapid course, the signs manifest themselves suddenly and with great intensity, and death occurs within twenty-four hours. Such cases, however, are exceedingly rare, and as a rule, even in fatal attacks, the unfortunates live three or four days.

Manifestly the chances of recovery depend on the cause. Obstruction to the gall-duct in consequence of inflammation in its lining, generally yields in the course of a week. If due to lodgement of a worm or gall-stone, the outlook is less favorable; while a plug of bile will generally be in time removed. Associated with intestinal obstruction, if the same gives way the jaundice ought to quickly disappear. When the liver itself is at fault and diseased, the chances are the smallest, although recovery is not impossible even then.

To determine the actual cause in any case will never be easy, indeed, it will always be difficult, but the following facts may assist towards a diagnosis.

Jaundice occurring suddenly, in apparent health, and not accompanied by pain or other very severe symptoms, can generally be attributed to disturbance of the nervous system, possibly caused by great excitement; and if that assumption be correct, the jaundice should prove transitory.

Very great depression characterizes this affection when due to disease of the liver or other organ, or to infectious fever, as distemper.

When attended with well-marked fever there is generally inflammation of the biliary passages or elsewhere within the liver; the latter being caused by some infective poison.

If it occurs suddenly, and is preceded by colic and vomiting, stoppage of the gall-duct is usually the cause.

Following gastric or intestinal irritation, it is generally due to a similar trouble in the gall-duct, and should speedily pass off.

When induced by pressure of tumors, possibly they can be detected by examination; or the poor health previously existing will have suggested the possibility of some such cause.

If associated with dropsy, the chances are that there is a disease of the liver which is likely incurable.

The primary essentials in treatment are to restrict the diet to milk, scraped raw lean beef, or other foods free from fats, sugar, or starches; quarter the patient in a comfortable room; give him gentle exercise occasionally, and under a blanket if the weather is cold; and keep his bowels moving two or three times daily.

Calcined magnesia suggests itself as the best laxative, and a teaspoonful to a large dog, two or three times daily, will be near right. Or if it is not sufficiently powerful, a tablespoonful of the syrup of buckthorn may be given every morning, unless its action is too pronounced, when, of course, the quantity must be lessened.

Until the laxative employed has made the movements easy, there is likely to be much straining because of the hard, dry, and lumpy condition of the intestinal refuse; therefore in such case it is advisable always to assist by means of injections of sweet-oil or soapsuds.

Colic occurring, it should have the usual treatment. So, too, with vomiting, the appropriate remedies for which have been duly considered elsewhere.

Gray-powder, calomel, or other mecurials are forbidden in popular practice, since to determine the actual cause existing will rarely be possible, and these agents if used must be given blindly, consequently be liable to do far more harm than good; moreover, if a case is curable, nature will be successful, provided the assistance advised be rendered her.

When the patient begins to improve the urine will be less dark colored. At the same time the discharges will darken; and they may be quite black and have much the appearance of tar.

Owing to the slowness with which the coloring matter of the bile is absorbed from the tissues, the whites of the eyes continue yellowish for some days after the function of the liver is restored.

DISEASES OF THE SPLEEN.

The spleen has been frequently removed without permanent injury, the most constant effects being increase of appetite and an unnatural ferocity ; but the same results have followed some other operations. This organ cannot, therefore, have great individual importance, and must be regarded as merely a help to other organs, which may, if necessary, completely or to a great extent perform its function.

Acute inflammation of the spleen or splenitis is an exceedingly rare affection. The symptoms which have been observed are restlessness, tenderness under the lower ribs on the left side, some fever, loss of appetite, vomiting, great thirst, and, as Youatt observes, "shivering, the ears cold, the eyes unnaturally protuberant, the nostrils dilated, the flanks agitated, the respiration accelerated, and the mucous membrane pale." The same author mentions a discharge of a yellow, frothy mucus by vomiting, which suggests that in those cases an abscess had formed in the spleen and perforation into the stomach had occurred.

This disease can scarcely ever be diagnosed during life. Were it detected, the general principles of treatment indicated would be much the same as in acute inflammation of other organs similar in structure.

In certain diseases of the general system, and in some affections of other organs, the spleen becomes enlarged for a time and then returns to its normal size.

Chronic enlargement of this gland, unless it be greatly increased in size, is rarely attended with any symptoms to indicate the condition. Were it discovered, the essential treatment would be symptomatic, and the same as in chronic hepatitis.

The spleen takes on degenerative changes in common with the liver, but a consideration of them can be of no possible interest or profit to the general reader.

HEMORRHOIDS.

Hemorrhoids or piles are small, rounded tumors, generally of a red or purplish color, which form just within or without the orifice of the bowel; hence the distinction between internal and external piles.

Dogs but rarely suffer from them ; and most of the victims are well advanced in life, and mainly house pets, which have had constipation, been highly fed, and lived lazily and indolently. Piles may, however, be caused by too frequent use of purgatives, and indeed by any agent which keeps the lower bowel constantly irritated.

External piles cannot be mistaken; but the internal may exist without detection, although they are sometimes forced out when the bowels move. Where this happens, usually at first and for a considerable time they quickly go back; but if they increase in size, eventually they remain out unless forcibly returned; and likely become swollen and excessively tender.

Internal piles are liable to bleed ; and they may be suspected if blood appears in the intestinal discharges. The victim licks around the opening of the bowel, led to do so by pain, and while in a sitting position draws himself over the floor or ground ; which is generally done to relieve itching.

The primary object of treatment is to remove the cause. If the patient is over-fed and denied sufficient exercise, these faults must, of course, be corrected. To keep the bowels acting freely is one of the essential requirements, for otherwise their movements must be painful. Green vegetables first suggest themselves. Then comes magnesia, which may be mixed with the food twice or three times daily. Or sulphur, in half-teaspoonful doses for all dogs excepting toys, may be given every morning; and this, also, can be put into the feeding-pan.

External treatment will do much to favor relief if not able to effect a cure. An ointment which promises well may be prepared of the following ingredients : Tannic acid, one drachm ; sulphate of morphia, four grains ; powdered camphor, half a drachm ; stramonium ointment, one ounce.

This is sedative and astringent, and if applied freely several times daily, will prevent friction, lessen pain and soreness, and tend to reduce the swelling.

In very obstinate cases, in which the tumors cannot readily be reduced in size by the ordinary measures, it is scarcely worth while to persist in such, and it would be far better to remove them at once by an operation. That of ligating is the easiest, and may be intrusted to the family physician.

Internal piles yield less readily to treatment; and as a rule to keep the bowels moving freely, and give glycerin two or three times daily, is about all that can be advised, or really requires to be done. Glycerin is not only laxative but acts well locally; and to dogs of largest size two teaspoonfuls, mixed with food, is a dose; one teaspoonful for from twenty- to fifty-pound dogs; and half a teaspoonful for the smallest.

As for the bleeding from piles, it is oftener salutary than otherwise, as it brings some relief. Nor is it likely to be severe enough to excite apprehension; but were it so, injections of cold water should control it.

PROLAPSE OF THE RECTUM.

Occasionally in old dogs and sometimes in young subjects the bowel falls and protrudes through the outlet. In the former the trouble may be due to a relaxed condition of the affected parts and straining consequent upon constipation, or it may be dependent upon irritation of the lower bowel, set up by foreign bodies that have been swallowed and are making their way out. And this seems to be by far the most frequent cause of prolapse, especially in early life.

A case within the knowledge of the writer may be instructive. It was that of a puppy some four months old. Several times his bowel was forced out a distance of at least six inches. On the third day three carpet-tacks were discharged; recovery then took place immediately.

When young dogs have prolapse the chances are many that there is a stone, bit of glass, sliver of bone, or other foreign body lodged in the bowel; and it will be well always to administer an injection of sweet-oil, two or three times daily. In the meantime, and as often as the bowel comes down, it should be first bathed with warm water and then returned. This operation will be easy if gentle and continuous pressure is maintained.

For several days thereafter the foods should be raw beef or milk and raw eggs, which are productive of the least waste and therefore favor quietude of the bowel.

Old dogs should be treated in much the same way; but if a lax condition of the affected parts is accountable for the accident and there is constipation, one or two movements daily should be promoted.

ANAL FISSURE AND FISTULA.

Anal fissure is a long, narrow, and irritable ulcer of the lowest part of the bowel, just within its orifice, and originates in a crack or break in the mucous membrane which lines the same.

It may be caused by intestinal irritation, hemorrhoids, constipation, or hardened refuse and violent straining necessary for its expulsion. It may also be induced by large bones having sharp corners or edges. These appear to be the most common causes; and where fissures occur, very generally there is a previous history of intestinal obstruction.

Pain is a prominent symptom, and evident from the fact that the sufferer does not have easy movements of the bowels; but while they are occurring he makes a feeble effort, then desists and runs about as though distressed, and likely emits short, sharp cries. Soon again he endeavors to effect a discharge, but is speedily stopped by the pain; and it is only after repeated efforts and much suffering that he is at last relieved.

The refuse when solid is streaked with blood, and sometimes purulent matter; while when soft the discharges are of small size, and they may be ribbon-like.

Only a person having an intimate knowledge of the appearance of the bowel in health can detect when it is diseased; consequently, if a fissure is suspected, professional assistance should be sought.

The treatment appropriate for the trouble in man is the proper one to apply with dogs.

In extremely rare instances they suffer from fistula in ano, which is of the nature of a tubular or pipe-like ulcer, which may be complete, that is, have an external opening near the orifice of the bowel and another in the wall of the bowel, a little above its orifice; or it may be what is called a blind intestinal fistula, which opens into the bowel but not externally.

Irritation and pain in the affected part cause the animal to act much the same as when suffering from piles. If the fistula opens externally, less difficulty will be experienced in making a diagnosis; but still, in only a few cases will detection be easy; indeed, rather the reverse, for in many instances the opening is minute and needs very close scrutiny to discover it.

The course of an external fistula is that of a frequently recurring abscess; the cavity fills up and discharges, the opening then closes, and again the cavity fills.

In searching for a fistulous opening, a minute drop of water in the centre of a slight swelling will often be found to mark its location. To explore its track a small "knitting-needle" will be sufficient.

When a blind internal fistula exists its presence may be suspected if there is a quite constant oozing or discharge from the outlet of the bowel of a thin watery fluid tinged with blood and of offensive odor.

Fistula is a common result of abscess near the orifice of the bowel. And if one forms and is allowed to "break" into the bowel, before the opening can heal up refuse matter is quite sure to enter, and thereafter this trouble will generally persist until removed by operation. Or fistula may be the result of an ulcer in the wall of the bowel, which, "eating" through the same, allows the passage of refuse into the cellular tissue, and once there it sets up an irritation and an abscess forms.

Palliative treatment may be employed by caretakers, and consists in correcting, in so far as possible, existing defects in management and health. Constipation should be overcome by a judicious selection of foods; or if they are not sufficient, a laxative must be employed. Ample exercise and other imperative essentials to right being must also be provided.

A radical cure of fistula demands a surgical operation. Of several popular methods the elastic ligature is the safest and best. But when an operation is imperative, a surgeon should be employed, and the method of procedure be left entirely to his judgment.

SECTION V.

DISEASES OF THE URINARY AND SEXUAL ORGANS.

CHAPTER I.

CONGESTION OF THE KIDNEYS.

IN the absence of inflammation an increased flow of blood through the arteries of the kidneys or obstruction to the return of blood through the veins of the same, constitutes congestion. This is of quite frequent occurrence in dogs; but it is only rarely detected, because the symptoms to which it gives rise are almost always mistaken for rheumatism.

Wet and cold are the common causes, although it occurs with various inflammatory and febrile diseases of the body, also affections of the heart and lungs; and it may be induced by chemical irritants.

An inability to get up with perfect ease, some stiffness in walking, especially when first starting, possibly slight arching of the back, and tenderness on each side of the spine a little below the edges of the ribs, are the symptoms usually presented. But if the congestion be considerable, the urine is rather scanty and high colored; and it may be albuminous. As a rule, however, to which there are only few exceptions, congestions do not seriously interfere with the function of the kidneys.

Unless the patient is neglected and further exposed to wet or cold, or fed improperly, this trouble should soon disappear of itself, provided it is not caused by some disease located elsewhere in the body, and the same still persists. But when these symptoms are detected, it is advisable always to put him into comfortable, warm quarters, for a few days restrict the diet to butter-milk, and bathe the back two or three times daily with hot alcohol or new rum, rubbing the same well into the skin on each occasion.

Internal medication will not be required in simple congestion of the kidneys, and under the treatment advised recovery should take place within a week.

INFLAMMATION OF THE KIDNEYS.

While the kidneys are not exempt from acute inflammation, termed acute nephritis, the same is rare except it be induced or invited by the mischievous use

of medicines. For instance, mercurials, and notably calomel, when given internally, stimulate these organs, and in some cases to the point of irritation; and while under their effects exposure in bad weather, that would not otherwise have done material harm, is now sorely felt by them, and often they are inflamed as a direct consequence.

Turpentine, which is sometimes given for the purpose of destroying worms, is another drug that is capable of producing inflammation of the kidneys.

With some kennel-men a mixture consisting largely of Epsom salts is popular; and this they give, as they say, for the purpose of "cooling the blood." Such is practically harmless when administered only occasionally; but if repeated day after day for several weeks, as in some instances, the kidneys are quite sure to be irritated, and likely inflamed; and the same result may follow a persistent use of compound cathartic pills.

The skin has some absorbent power but it falls far short of the extent to which it is generally credited; and only very powerful agents can be drawn from the surface in sufficient quantity to affect the system within. Such also must be applied in very generous quantities in order to have any marked physiological effect. In other words, while through absorption there is some danger from carbolic acid, mercurials, and other powerful drugs which are often used externally, only when applied in large quantities and allowed to remain long on the skin is poisonous absorption possible.

Where it does occur, from the peculiar nature of the medicines applied, the baneful effects are apt to fall on the kidneys, and they might in consequence be inflamed.

While the danger from absorption through this avenue is never great if good judgment in the use of powerful chemicals is displayed, that it exists may properly be kept in mind, especially when treating mange, eczema or other extensive skin eruptions.

Among other possible causes of nephritis are kicks and blows over the region of the kidneys, blood poisoning from distemper, and exposure in bad weather. There are also contributing causes, as ill-kept, foul-smelling kennels, debility resulting from disease, improper feeding, etc.

The usual symptoms of acute inflammation are not pronounced, and the presence of the disease is not likely to be detected unless the attack is very severe. Uneasiness, with frequent and difficult urination, the urine being scanty and of a smoky color, possibly slight fever, a stiff and stilted gait, the hind legs being carried straight, tenderness on pressure over the loins and back a little beyond the ribs, and constipation, the intestinal discharges being hard and dry, are the signs generally manifested.

The changes in the character of the urine are occasioned by unusual ingredients, and the presence of such is absolute evidence of disease of the kidney. But the eye cannot detect them, and a chemical examination is necessary. This

can be made by any druggist, who will have merely to test for albumen ; and that found, it may be accepted that the kidneys are seriously at fault.

Kept in a warm room of uniform temperature, that the skin may be at its best and do much of the work of the kidneys, and on a diet of milk, a dog suffering from this affection should do well without the use of medicines. But at the same time it would generally be advisable to give a laxative, that the bowels may assume a share of the kidneys' duty. Large doses, however, are contra-indicated, and merely sufficient is required to cause three or four movements daily.

Acute inflammation of the kidneys may become chronic if there is neglect in management, and especially to protect the patient from exposure to cold. This unfortunate ending, however, is far from common. Indeed, chronic inflammation of the kidneys is very rare, and almost always occurs as a result of obstructed circulation, as in heart disease. In its early stages, also, it would be quite sure to escape detection, failing as it does then to give rise to pronounced symptoms, or indeed to any that are suggestive of kidney affection.

After it has well advanced, and possibly been on six months or a year, or longer, chronic disease of the kidneys usually gives rise to signs that indicate serious trouble somewhere within the system ; but they may not point to the kidneys, and if not, likely the real cause is not detected.

With the kidneys so disabled, albumen might appear in the urine ; but still it is often absent until very great degenerative changes have taken place. The quantity of urine excreted signifies but little, because during this disease it may be less or more abundant than in health. In the advanced stages, however, it is scanty, of dark color, and quite heavily loaded with albumen.

As a rule the heart steadily fails in power, until it is very weak and irregular, and the pulse thin, thready, and intermittent. The meanwhile chronic changes of an inflammatory nature have been taking place in other important organs. Digestion is seriously faulty, and generally there is obstinate although not very severe bronchitis. The appetite is poor, the manner dull and dispirited, exertion is avoided as much as possible, and when forced, the fatigue caused is very great. Finally, the kidneys having become so degenerated that they are no longer capable of doing more than a very small part of their work, the system is saturated, as it were, with the poison that they should have thrown out ; there is more or less dropsy, and in most cases convulsions set in before death.

Recovery from chronic inflammation of the kidneys cannot occur, nor is much improvement possible after the disease has well advanced. Until then, under right treatment, its progress may be somewhat delayed ; but still it promises so little yet is so exacting it were best always to sacrifice the patient as soon as a positive diagnosis of the disease is made.

DISEASE OF THE PROSTATE.

The prostate is a large, firm, glandular body, which surrounds the neck of the bladder and first portion of the urethra.

Its function is solely a sexual one, and it exists only in males.

Although subject to diseases, both acute and chronic, by far the largest proportion of them is of the latter class. Where the former have occurred it has not been possible to clearly define their causes; but there seems reasonable ground for the belief that many of the attacks were attributable to excessive stimulation,—too constant use in the stud.

In acute inflammation of the prostate, termed prostatitis, if the attack is mild or of only moderate severity, pain during discharges from the bowels and bladder, and more frequent urination than in health, may be the only symptoms suggestive of the trouble that are manifested by it. But where the inflammation is severe and involves the entire gland, usually the bladder does not empty itself, and there is constant dribbling in consequence of overflow. After long continuance of obstinate forms blood is also likely to appear in the urine.

The condition of the prostate may be made out by means of the forefinger in the rectum, its introduction being easily effected when oil, lard, or something of the sort is used to lubricate it.

When the gland is inflamed it is more or less enlarged, hot, and tender; and catheterization causes great pain as soon as the tip of the instrument has penetrated to that part of the urethral canal which is surrounded by the prostate gland.

Acute inflammation of only mild intensity might subside after a time without leaving any distinct trace of its occurrence; but in very severe attacks the inflammation is liable to extend to neighboring parts, or abscesses form and break through into the pelvic cavity, the bladder, urethra, or intestine.

To deplete generally is one of the purposes of treatment; and to this end the diet should approach for a time the starvation sort, and only small quantities of bland and unstimulating foods be allowed, as rice, milk, the gruels, etc. The bowels should also be kept free by means of a simple laxative.

Warm loin-baths are helpful. The catheter should be passed at quite frequent intervals; for when the urine is retained, after a time it liberates ammonia, which is an active irritant and serves to inflame the bladder.

Chronic prostatitis occurs among old dogs, and especially members of the large breeds that have been kept much on the chain, yet generously fed, and in consequence are of dull, sluggish, and indolent habit, and far from high health. It may develop from the acute form, but is generally chronic from the first.

The entire gland is enlarged, although irregularly, the increase being usually greater on one side. Irritability of the bladder is associated, and eventually the

walls of that organ become more or less thickened and contracted. Pain does not appear to be a prominent symptom, although likely some exists at times.

Frequent urination and perhaps straining, with ineffectual attempts to urinate, are about all the symptoms notable. On examination with the finger in the rectum the enlargement can be made out; and the presence or absence of heat and sensitiveness will indicate whether the trouble is acute or chronic.

The enlargement is not likely to be influenced by treatment; and efforts can properly be restricted to keeping the bowels free, digestion active, and the general health as good as possible.

To remove the gland is not a very difficult operation, and the chances of recovery from it should be good; but, of course, the operator must be a skilful surgeon, and consequently the expense would be very great.

Cases of cancer of the prostate have been recorded; and in one instance within the writer's experience the victim was a mastiff, about four years of age, which had been accustomed from birth to a wholly meat diet, and a quantity of food far beyond his needs.

A diagnosis is always difficult in this class of cases, and professional aid imperative.

RARE DISEASES OF THE KIDNEYS.

In consequence of injuries to the kidneys or parts near them, as by kicks or blows, abscess of the kidney is possible; and it may form first in that organ or extend to it from adjacent parts. It may also be associated with diseased conditions elsewhere that produce serious changes and obstructions in circulation, as in certain affections of the heart.

This is manifestly a grave affection. It is also one that is not easily recognized. The most prominent symptoms are weakness and great tenderness of the back, frequent and difficult urination, fits of shivering followed by fever and sweating, emaciation, and gradual exhaustion. In the course of the disease pus in considerable quantities is thrown out in the urine. The abscess may burst and discharge through the urinary passage; it may also burst through the loin, or into the intestine or peritoneal cavity; while in extremely rare instances, in which the abscess is small, a spontaneous cure is effected by the pus becoming converted into an innocuous chalky substance.

Amyloid kidney is a form of chronic disease that is commonly secondary, and arises in connection with other grave and exhausting constitutional maladies or serious diseases of the bones and joints.

The name given it comes from the appearance of the cut surface of the organ, which looks as though it were infiltrated with wax. It is also much contracted.

The symptoms present are scanty and albuminous urine, vomiting and diarrhoea at times, and finally dropsy and convulsions shortly before death.

Cancer sometimes involves the kidney. Usually it is a primary affection, although it may be an extension of malignant disease in some other part of the body.

Its symptoms are very obscure, and consist of bloody urine, tenderness in the loins, a tumor in the region of the kidney, emaciation, and exhaustion.

In each kidney there is a cavity, called the pelvis, into which the uriniferous tubes discharge the urine. This is subject to inflammation, termed pyelitis. The same may be induced by exposure to cold, the presence of stone, obstruction to the lower urinary passage which causes retention and decomposition of the urine, and by extension of inflammation from the bladder. It is also theorized that it may be caused by poisonous irritants passing through the kidneys; and it is known to have been produced by a parasite named the *strongylus gigas*.

It may be of mild or of severe and destructive form. The symptoms usually closely resemble those which are manifested by acute nephritis, to which are commonly added signs of catarrh of the bladder. But a positive diagnosis is only possible by means of the microscope, under which appear peculiar forms of epithelium.

So-called cysts of the kidneys are dilatations and enlargements of the pelvis, produced by obstructions in the lower urinary passages. Where the obstruction is great and of long continuance a pelvis is so much distended that its walls become thin and the appearance of the kidney is bladder-like.

When the enlargement is great a tumor can be felt in the region of the kidney. If only one organ is affected, other and prominent symptoms are not likely to be exhibited; but where both kidneys are involved, the urine is soon suppressed and uræmic poisoning occurs.

Stones are now and then found in the pelvis of the kidneys, varying in size from a pin's head to that of a bean, or possibly larger. While yet very small they may make their way out through the urinary passage, causing intense pain. Large stones, however, are not productive of any characteristic symptoms.

CHAPTER II.

IRRITABILITY OF THE BLADDER.

By irritability of the bladder is meant a slight irritation of its lining membrane, which causes merely frequent urination. It is the most common of all affections of the bladder. While none are exempt from it, by far the most frequent victims are contestants at shows, dogs sent on journeys in crates, or house pets kept in large towns and cities, whose outings depend upon the convenience of their owners or caretakers. In such cases, obviously, the cause is retention of the bladder's contents, which soon undergo decomposition and changes which render it irritating.

As a rule when due to this cause the affection is transitory, and entire recovery occurs in the course of from two to five days. It may, however, persist for a longer period; in which case it is quite certain to become an actual inflammation.

A dog that has the habit of neatness will often suffer intensely before he will soil his crate or bench at a show; and in some instances there will be retention of nearly forty-eight hours. The victim then presents a tucked-up appearance, his abdomen being shrunken and its walls hard, while his back is arched. Now when let out he is seen to strain in his efforts to urinate. But at first they are ineffectual, because the expulsive power of the bladder has been too much weakened by the distention. After a time, however, a few drops are expelled; again and again small quantities, until finally the act is complete.

Generally for a day or two thereafter there is some "weakness," characterized by frequent urination; but, as said, usually all signs of trouble speedily disappear.

Irritability of the bladder is sometimes attended by more or less spasmodic stricture and inability to pass the urine. The same may be confined to its neck, or the irritability may cause the walls of the bladder to contract violently, and thus its cavity be greatly reduced in size, so that not only will it hold a very small quantity, but the urine can scarcely be passed except drop by drop, and always with intense distress. If the catheter is then introduced the operation is very difficult and exceedingly painful.

Beyond retention there are several other influences which are occasionally active in producing irritability of the bladder, and among them are chemical irritants, as turpentine, and the peculiar excitement from which dogs in the stud are victims.

To allow the patient much liberty and largely restrict the diet to milk for a few days, is all that is required in the way of treatment for this affection.

INFLAMMATION OF THE BLADDER.

Mild attacks of cystitis, or acute inflammation of the walls of the bladder, occur now and then among dogs; but they are fortunately only rarely victims of the severe form, which is a most distressing malady.

Cystitis may have its origin in simple irritability produced by retention of urine, and this appears the rule; but it can be the result of direct injury, as kicks, blows, and crushes. While turpentine, carbolic acid, and certain other chemical irritants are occasionally the exciting causes, in some instances it is attributable to chilling, in others to the microbes of infectious disease. It is present where there is stone in the bladder. Inflammation in neighboring parts or associate organs may extend and involve the bladder. Cystitis is also a common complication of prostatic enlargement. Finally, cases of this affection arise without apparent cause.

Frequent efforts to void the urine, with notable increase in the quantity of the excretion, are generally the first evidences of it to attract attention. With the attempts there is decided straining; the quantity passed at each is small, and may be limited to a few drops, and there is apparently considerable discomfort in the act, for the victims are restless, and during it they often emit short cries of distress. In severe cases the gait is "straddling," the back arched, and the walls of the abdomen retracted; while pressure over the region of the bladder causes shrinking, which indicates that there is soreness within. In such cases there is some fever as a rule; but the same rarely runs high, nor is it constant. General lassitude and depression, constipation, and loss of appetite are also associate symptoms.

Changes in the character of the urine usually occur, although in some instances it is nearly normal in appearance. It is occasionally thick, turbid, and much like gruel, but oftener of dark reddish color, and it may contain blood and pus; in which case the attack is very serious and promises to prove exceedingly obstinate.

As a rule this disease if mild or of only moderate intensity runs a rapid course and recovery speedily takes place; that is, provided the cause does not persist,—as where there is calculi or a stone in the bladder—and no other disease is associated to keep the inflammation alive. Severe acute cases are liable, however, to prove tedious, and terminate in the chronic form of the disease. They may even end fatally in consequence of perforation of the bladder, peritonitis, gangrene, or uræmic poisoning.

The primary essentials in treatment are rest for the patient, warm, comfort-

able quarters, and a diet largely composed of new milk, skimmed milk, or butter-milk; or of boiled rice, arrowroot, gruels, or meat jellies, if milk is declined. Cool, fresh water in abundance should also be provided; the purpose being to dilute the urine and cause an abundant flow.

The balsam of copaiba may be given every three or four hours. Of this the dose for all dogs of over twenty pounds in weight is ten drops; for smaller, excepting diminutive toys, five drops; while two and three drops are sufficient for the little ones, as Yorkshires.

This oil may be given in a little milk, or in gelatin capsules which can be enveloped in a bit of scraped beef and tossed to the patient.

CATARRH OF THE BLADDER.

Catarrh of the bladder is a chronic inflammation of mild intensity, characterized mainly by a discharge of stringy mucus.

It may be the result of acute inflammation; but far more often it is due to obstructive disease of the urethra or prostate, stone in the bladder, weakness of the muscular coat of that organ, or disease of the kidneys. Now and then it is attributable to paralysis; and there are various other morbid states with which it may occur as a complication.

Some of the symptoms of catarrh of the bladder resemble those of acute inflammation, but they are of much milder character. Until late in the disease, pain in the region of the affected organ is not present in notable degree. Owing to changes that take place in its walls the bladder loses much of its contractile power, and at times becomes greatly distended. Great distension may also result from paralysis at its neck. Not able to empty his bladder completely at will, the victim passes only small quantities of urine at each effort. Or, unable to retain his urine for any considerable length of time, it dribbles away drop by drop. It is more or less ammoniacal, and the stringy mucus of variable quantity, according to the grade of the inflammation.

While this affection exists, exposure to cold and many other influences which ordinarily would not be harmful are capable of exciting severe acute inflammation of the bladder with all the characteristic symptoms.

A cure is not easy in any case, and certainly none would be possible until the cause had been removed. Then the treatment would be the same as in inflammation of the bladder. When to remove the cause were not possible, it were better to sacrifice the victim, although palliative measures might afford him some comfort.

Washing out the bladder has been recommended, but obviously such treatment would be very expensive, since it must be applied by a professional.

STONE IN THE BLADDER.

Cystic calculus or stone in the bladder occurs in dogs only rarely, and most cases have been in subjects of advanced age.

It may exist for a long time and not give rise to appreciable symptoms; but as a rule there are signs of irritability of the bladder, and occasionally symptoms of severe acute inflammation are presented. These exist for a time and then subside, to return again after another interval, which may be of a few weeks' duration, or possibly of several months.

Only a skilled hand can detect stone with reasonable certainty in any case, while in some instances a positive diagnosis would be absolutely impossible. There are outward signs, however, which are suggestive. One is the sudden stoppage of the flow during urination, the same being the consequence of the stone being washed against the neck of the bladder and made to act as a valve. Another is the appearance of blood in the urine. It is also sometimes found at the opening of the passage to the bladder after urination, in which case it is of bright red color and limited to a few drops. There are times when for the victim to void his urine is impossible for several hours, or he can pass only a few drops. He is then very restless, strains violently, whining the meanwhile, and keeps his head so turned that he faces his loins.

If such experiences are frequent he loses his appetite and falls out of condition. He is no longer able to take active exercise, but moves unsteadily, with legs apart and back arched; while now and then, the urine being retained, his abdomen is distended and the bladder can be felt through its walls.

If of small size, the stone may become lodged in the urethra or neck of the bladder, and in consequence the passage of urine be entirely prevented, or at best it be discharged only drop by drop.

Such condition existing, the urine must be drawn; the stone being first pushed back into the bladder, unless a small catheter can be made to slip by it. But to dislodge it or get by it is often impossible; in which event, if an operation is not performed and relief thereby effected, the bladder must burst in the course of two days. In that case the suffering for a time grows steadily more intense. There is at first extreme restlessness and evidently great pain; but eventually the poor dog becomes dull, and soon thereafter is wholly unconscious. He is bathed in cold sweat, trembles or shakes quite constantly, and possibly has convulsions before death brings relief.

If the stone is too large to become fixed in the neck of the bladder or urinary passage, and the symptoms excited are mainly those of inflammation of the bladder, the usual treatment for that affection should be applied; and likely they will subside under it in the course of ten days, but recur again in the near future.

Thereafter, and until the inflammation returns, there appearing to persist some irritability of the bladder merely, it would scarcely be advisable to drug, for it could not do much good. Certainly the stone would not be dissolved either by medicines given through the mouth or injected into the bladder.

Stone can be taken intact from the bladder or crushed and removed in minute pieces, but the operations require skilled hands. When the stone is small and has lodged in the urethra or neck of the bladder, it can sometimes be pushed back; but if not, or it cannot be passed, it becomes necessary to cut through at the point of obstruction and effect removal by way of the incision.

If to pass a catheter is not possible, and the bladder must burst if not otherwise emptied, relief can be promptly effected by means of a small trocar and canula. In the female this should be entered on the median line, at the so-called brim of the pelvis. In the male the point of entrance should be low down and as near the brim as possible, but either on the right or left side of the flank.

HÆMATURIA.

Hæmaturia or bloody urine may occur in consequence of trouble in the bladder or the passage to it, but in most cases it is due to intense acute congestion of the kidneys. Such attacks may be occasioned by blows or other injuries across the loins. They seem due, also, in occasional instances, to simply an abnormal sensitiveness of those organs to the influence of cold. As a rule, however, they have been found after death to have been caused by stone in the bladder or kidneys, or by parasites in the latter, especially the giant strongyle, which is a most troublesome intruder.

For a day or more before the urine becomes bloody the victim is generally dispirited; he shivers now and then, and exhibits decided stiffness in getting up or lying down. His nose is hot, he has some fever, and vomits occasionally. His urine is of a port-wine hue; it is voided at frequent intervals, and with evident discomfort.

Attacks caused by traumatic injuries to the kidneys are commonly soon recovered from. When induced by kidney calculi they are also usually transient, but recur at intervals. But if due to parasites, the result is, as a rule, soon fatal.

As regards treatment, about all that can be done is to afford protection against exposure to cold and properly nourish with bland and non-irritating foods, as milk, boiled rice, thin gruels, and broths. Butter-milk is of special value in such cases, and the quantity need not be restricted. When recovery is possible, it will occur under good management and nursing without the aid of medicine.

CHAPTER III.

RETENTION OF URINE.

THE term retention in this connection signifies an inability to pass the urine from the bladder. It is to be understood that there is urine to pass, and the condition must not be confounded with suppression, in which none is passed because none is secreted.

Retention of the urine may arise from causes functional or organic. Among the former are included paralysis, or want of power in the muscular coat of the bladder, and spasmodic stricture of the urethra, or canal from the bladder by which the urine passes off.

The organic causes include obstruction to the canal by contraction, termed permanent stricture; stoppage of the tube, the same being blocked up with small calculi coming from the bladder; obstruction of the tube by organic disease, as in enlarged prostate, and inflammation and swelling of the mucous membrane of urethra. Possibly blood-clots may form and thereby obstruct the passage; and cases have been reported where worms have lodged in the canal and closed it.

The loss of power in the muscular coat of the bladder may be due to true paralysis, also existing elsewhere at the same time, or to purely local paralysis induced by distention occurring during the confinement of dogs that are excessively neat in their habits. Spasmodic stricture may be caused by exposure to cold and damp, and by certain medicines taken into the stomach, as cantharides. That drug, by the way, might be absorbed from blisters and have the same effect. Such stricture, also, sometimes occurs in stud dogs, and results from undue sexual excitement.

Restlessness and continuous pain, with constant and ineffectual efforts to urinate, are the prominent symptoms. The animal's movements are unceasing, and his gait stiff and "straddling." In getting up and lying down his actions are restrained as though painful. The abdomen is distended, and pressure over the bladder causes shrinking and distress. Unless relieved the pain grows more severe, vomiting occurs, the pulse runs high, becomes weak and feeble, and the general appearance indicates gravity. Finally, in most cases convulsions set in and are followed by profound stupor and death.

If the symptoms are not extremely urgent, one or two grains of opium, according to the size of the dog, should be given, and followed by a hot loin-

bath. The great object is to arrest the efforts of the animal to urinate ; and when they are stopped, sometimes the bladder will empty itself. After the opium a dose of castor-oil should be administered.

If these measures are unsuccessful, a surgeon should be called and the catheter used to evacuate the bladder.

Retention associated with true paralysis demands the use of this instrument, and the employment of treatment elsewhere advised for the latter.

A dog to be catheterized should be placed on his side or back, and held firmly by assistants, of whom there must be a sufficient number to keep the patient in position.

Unless the operator is equally skilful with both hands, it would be well for him to grasp the external organ with the left and introduce the instrument with the right hand.

Catheters designed for use on man must generally be used, and the best form for him who has not had much experience in catheterizing dogs is that made of soft rubber. It should be of small size, and constantly rotated while it is entering.

In the absence of a soft rubber catheter one made of hard rubber should be used, and with the wire stylet in place. This, however, should be first removed, and much of the bend taken from it, so that it will be nearly straight, the curve remaining being a long one—not short and confined to the end as when intended for use on man.

When the patient is a female, the ordinary metallic or German silver catheter, appropriate for women, may be used, if she is of small breed ; but if of the largest, the male catheter of hard rubber will be much the best. The stylet of this should be bent at its outer end until it has that same short curve that is on the metallic female catheters.

The catheter, having been well lubricated with sweet-oil, vaselin, or fresh lard, should be inserted with gentle force. The patient being a male, after passing easily for a short distance, the instrument will encounter an obstruction. Here the canal narrows a little, there is a bend in it, and a spasmodic contraction of its walls is generally excited. But steady pressure will soon cause this to yield, and the catheter will again pass in quite easily for a short distance,—until the so-called arch of the perineum is reached.

If a hard rubber catheter is being used, the wire stylet must now be withdrawn at least one-third, to allow the instrument to make the curve.

When the neck of the bladder is reached the muscles controlling the opening contract and resist further advance ; but they soon relax under gentle pressure, and allow the bladder to be entered. The stylet should then be entirely withdrawn.

In cases in which much difficulty is encountered in passing the catheter, the forefinger may be inserted in the rectum and the point of the instrument guided by it around the bend, where the trouble is located.

In catheterizing a female, the instrument is passed upon the floor of the vagina until it reaches the urethral opening. Here it encounters the so-called urethral valve, which is merely a sphincter, or circular muscle, that closes the orifice. Its entrance is resisted by contractions, but they are soon overcome by gentle pressure.

Catheterization in the female is much easier than in the male, yet even in the first instance some anatomical knowledge of the parts is required; hence the operation ought never be undertaken except by professionals.

PARAPHIMOSIS.

The organ of generation returns to its sheath after "service" much more speedily in some dogs than in others. And not infrequently it remains protruded for ten, fifteen, or even twenty minutes, during the most of which period it is intensely swollen and purplish. Finally the deep color begins to fade, the swelling lessens, and the parts are restored. In extremely rare instances, however, the organ does not return voluntarily, but remains uncovered until assisted back to its place. It is then that the condition known as paraphimosis exists.

There may be a peculiarity in the sheath to favor this accident; but as a rule it is caused by interference, which is due to apprehension on the part of the owner or caretaker that the natural order of things will not be restored without it.

The fact is urged that dogs should be left entirely to themselves until it is plainly evident that they require assistance, and this will certainly not be within half an hour after use.

If at the end of that time there is no sign that the swelling is lessening, the dog should be first muzzled, especially if of large breed, and gently laid on his side. Cloths wrung out of ice-water should then be constantly applied for half an hour, or the affected parts be enveloped in muslin which holds cracked ice.

The period stated having passed without improvement, a surgeon should be called to "nick" the sheath so that the organ may pass back.

Dogs have been killed by this accident, the protruding parts having strangled and died; but their lives were literally thrown away, because the simple treatment advised must have saved them.

BALANITIS.

The mucous membrane of the covering or sheath of the principal organ of generation of the dog is sometimes inflamed, and there then exists the affection known as balanitis.

Only in rare instances can the cause of this be determined; but it is safe to assume that the inflammation may be excited by constitutional troubles as well as local irritations, for it is occasionally noted late in distemper.

It gives rise to considerable discomfort, and induces the victim to frequently lick the affected parts, from the opening of which there is discharged a thick and yellowish matter. Usually also, but not always, there is some local swelling, tenderness and redness.

Cleanliness is the primary essential; and this alone maintained, a cure will often speedily occur. It is well, however, to use a medicated lotion, and a very efficacious one may be made by adding half an ounce of tannic acid to a half pint of water. The sheath having been drawn back as far as possible, the exposed parts should be bathed with this three or four times daily.

Where there is swelling and tenderness, it is advisable to bathe with clean water, as warm as can be borne without discomfort, for five or ten minutes before using the lotion of tannin. But in this instance the sheath should not be drawn back while the warm water is being applied.

Balanitis may prove obstinate, yet in a fairly healthy subject a cure should eventually take place. But the fact must be kept in sight that oftener than otherwise the affection is made worse by experimenting with medicinal applications.

URETHRITIS.

The passage by which urine is discharged from the bladder is known as the urethra, and inflammation of its lining membrane as urethritis, an affection that is not common in dogs.

Some of the sufferers from it have prostatic trouble, and disease of that gland appears to favor urethritis. Among other probable causes is the lodgement of dirt in the affected parts. It may be due to peculiarities in the urine which render it highly irritating, and such condition generally exists when the passage of urine has been obstructed and ammoniacal changes have occurred in it while retained in the bladder. It may also be rendered irritating by certain medicines and foods. Condiments, for instance, have that effect upon the urine; hence it is not surprising that a large proportion of its victims are delicate and pampered pets, fed at the table, also frequently on candies, pastries, and the like.

This affection is characterized by redness and slight swelling of the passage, and more or less profuse muco-purulent and yellowish-white discharge, which, when the sheath is forced back, is seen to come from the urethra, and thus an attack is distinguishable from one of balanitis.

Cures usually take place in the course of two or three weeks without inter-

ference, but, when it is absolutely necessary, an injection of sulphate of zinc—two grains, to water one ounce—may be used two or three times daily. If under this treatment recovery does not occur in the course of a week or ten days, there should be substituted an injection made of one drachm of the sub-nitrate of bismuth, two and one-half ounces of water, and two drachms of glycerin, to be used two or three times daily. If this in turn fails, capsules of the balsam copaiba and cubebs should be obtained, and one administered, concealed in a bit of meat, three or four times daily.

Such capsules are on sale with druggists, and are appropriate for all breeds excepting the smallest, with which it is best to trust wholly to the local measures of treatment advised.

In all cases of urethritis the diet should consist of bland foods, and milk may wisely be the main reliance.

GENITAL AFFECTIONS.

In consequence of a small number of causes the genitals of males may suffer from inflammation. Those causes are nearly all traumatic, and consist of blows, kicks, or other direct injuries; but in very rare instances quite serious trouble is induced by a parasite known as the "bot-fly."

This parasite or grub burrows into the walls of the bag, called the scrotum, which encloses the glandular organs, and causes swelling in the immediate neighborhood until a round, quite hard mass or "lump" is formed.

This enlargement may exist for a long time without change, apparently causing the dog but little if any discomfort; but it is liable in time to become an abscess, which, if allowed to run the usual course would likely excite much inflammation in adjacent parts, also destruction of the affected walls, and possibly the gland within.

Inflammations induced by injuries require much the same treatment as similar troubles in other localities; that is, if there is much swelling and tenderness, soothing applications are demanded, and may be of warm water merely; or if the skin is not broken, the following can be advantageously employed: Solution of subacetate of lead, one ounce; dilute acetic acid, half an ounce; water, one pint.

With this the parts should be frequently bathed, and kept as quiet as possible.

Were the glandular organs seriously injured and the chances of a complete cure decidedly doubtful, castration might properly be performed.

To remove a bot-fly, an incision should be carefully made and the grub dissected out, entire if possible; but if there is doubt as to the removal being complete, the bottom of the incision should be thoroughly cauterized, that any remaining portions of the parasite may be with certainty destroyed.

Occasionally there occurs a form of irritation of the scrotum which if neglected is very liable to become cancerous and involve the entire genitals.

This irritation seems to have a decided preference for old dogs; yet it is sometimes noted in quite early life, in which instance the victims are generally dogs that have been accustomed to meat in excess from puppyhood.

At first the irritation has nothing to distinguish it from other irritations or superficial inflammations, the parts being merely reddened and sensitive. Little pimples appear, enlarge, and become pustules, then they discharge and crusts form. When these are rubbed off, their bases are found to be small, shallow sores; but they deepen and extend unless prevented by treatment, while the surrounding tissues become thickened and hardened. Finally they break down and slough, like all ordinary cancers in the advanced stages.

For true cancer of the scrotum there is no cure, but the irritation which precedes it may be overcome. The first indications are to restrict the diet to such bland foods as bread and milk and beef-teas, move the bowels freely, and apply the oxide of zinc ointment, with each ounce of which there has been well mixed about fifteen grains of carbolic acid.

If ulcers have formed and do not heal readily under this treatment, it will be advisable to seek professional assistance, and have them burned out by means of pure carbolic acid, after which an ointment may be used as before.

INFLAMMATION OF THE VULVA.

Abnormal vaginal discharges, if persistent for considerable period, very generally cause irritation of the outlet or vulva, and possibly excoriations; but these parts may be affected independently of the vaginal passage, and by a trouble which resembles balanitis.

Where there are irritating discharges and the vulva is materially affected by them, the outer parts should be frequently anointed with lard, vaselin or the oxide of zinc ointment.

When irritated or inflamed, to keep the vulva as clean as possible and frequently apply a solution made by dissolving one drachm of the sugar of lead in a pint of water, is all that ordinarily will be required, unless there is excoriation or ulceration, when the zinc ointment will be indicated.

MORBID GROWTHS.

Warts or vegetations now and then appear on the genitals; and while they may not in all instances do real harm, they are very unsightly, and the reader should be informed of methods for their removal.

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Large warts, in this situation, which are shallow and only slightly elevated above the surface, can be removed by cauterizing with pure carbolic acid, the crystals being heated until dissolved. In using this the parts around the wart should first be covered with oil, to prevent the agent from reaching them. Then by means of a swab, consisting of a stick with a bit of cotton at the end, the wart should be sopped with the acid.

The dog being held the meanwhile, that he may not lick the application, after fifteen or twenty minutes the parts treated should be freely bathed with warm water; then dried and dusted with powdered sulphur.

Another efficient remedy is the saturated solution of the bichromate of potassium. It should be applied by means of a small swab or camel's-hair brush once daily.

The so-called one-night corn-curiers owe their efficacy to salicylic acid, to which alcohol and ether are commonly added, and the whole incorporated in collodion.

Such preparations often act quite as well on shallow warts as on corns, and there is certainly no reason why they should not be given a trial.

Warts or other growths which have trunks or rise considerably from the surface should be ligated, for were they removed by scissors or knife there might be troublesome bleeding.

This operation is very simple. A strong silk thread can ordinarily be used, but where the growths are quite large a fine elastic cord is better. The tying should be done as closely as possible to the surface, and the thread or cord drawn tightly. It will then cut through in a few days and the growth drop off. Or should the ligature become loosened, it ought to be tightened.

Where there are several warts, unless they are so clustered that they must all be ligated together, it is advisable to treat each separately.

CHAPTER IV.

VAGINAL DISCHARGES.

THE pelvic organs of females are not exempt from disease; but as a matter of fact their liability to them is only slight, and many reach old age after having passed through the usual vicissitudes of their kind, — been frequently in whelp, had large litters, etc., — and yet suffered from none of the “weaknesses” which would seem but natural results of those experiences. Yet while such diseases are quite rare, the fact that they do occur makes it advisable that they be at least touched upon here. And since they nearly all give rise to vaginal discharges that are somewhat peculiar and suggestive of the cause, this head is chosen to cover a general discussion.

Excluding the discharges that appear during the season and whelping period, since they are normal, the most common discharge is mucus. The character of this will sometimes serve to indicate its source. Thus, if thick, stringy, and containing what are usually termed lumps, — masses of curdled mucus, — the chances are that it comes from the womb, and its most posterior part, known as the neck. Whereas if the discharge is creamy and resembles pus, is profuse and quite persistent, probably its source is the body of the womb.

A thinner mucous discharge, nearly transparent, is likely vaginal. But it may be quite thick and still be confined to the vagina; in which event the common cause is worms that have migrated from the bowel.

These various discharges indicate either irritation, inflammation, or other disease of the womb or vagina.

Mere watery discharges, profuse and constant, would suggest a polypus or cancerous trouble of the womb; and did this discharge change in time, have mixed with it grayish particles at first, finally become bloody or give place to pure blood, and have a highly offensive odor, then the diagnosis of cancer would be reasonable.

Purulent discharges may be due to inflammation or ulceration of the womb. Usually the latter is the existing condition, and in much the largest proportion of cases the trouble is at the mouth of the womb, which to the touch appears uneven and wart-like; and a slight show of blood is noted after the examination.

Discharges of reddish color, due to admixture of blood, may proceed from ulcerations of the womb, morbid growths, — as tumor, polypus, etc., — or from malignant disease, as cancer.

Offensive discharges in the non-pregnant condition suggest cancer ; but that malady is so rare, it would be far more reasonable to suspect that premature delivery had occurred, and something that should have come away had been retained and decomposed. While appearing soon after whelping, such a discharge would point to a dead puppy or other decomposing matter in the genital canal, or occasion suspicion that puerperal fever was on or threatened.

Since vaginal discharges may depend upon a variety of diseased conditions, obviously treatment that will promise well must be in accordance with the cause. To determine that, however, will rarely be easy in any case, and almost impossible in many. Nevertheless good may be done in some cases by the employment of vaginal injections of water holding certain medicines, the most valuable of which are the astringents.

To administer these injections is easy with some subjects, but very difficult with others, and especially those of highly nervous temperaments. In no case however should they be resorted to unless they are absolutely required. For instance, a watery, mucous, or bloody discharge that has only recently manifested itself could scarcely be rightly interfered with, but in the absence of more serious signs should be left to nature for a time,—a week or two, perhaps,—and entirely when there is steady, even if only slow improvement. The same is in part true of offensive discharges, excepting always after whelping, although so long a delay might not be justified as in the first instance.

As for a purulent discharge, that could properly be treated within a day or two.

Where there seems to be vaginal irritation or inflammation, or worms are suspected, a solution of tannin, one drachm to a quart of water, is very serviceable. Should this not have any decided effect, and the trouble has existed several weeks, a solution of the sulphate of zinc, one teaspoonful to a quart of water, might be used for a week, and then a return made to the tannin.

If the discharge be offensive, an injection of warm water merely should be used, to wash the passage well ; and the bad odor still existing, a twenty-five per cent or stronger solution of the peroxide of hydrogen should be injected.

Purulent discharges may be treated with the tannin or zinc solutions.

Unless the discharge is offensive or purulent,—when frequent injections each day will likely be required,—one daily will be quite enough as a general rule.

Occasionally a vaginal discharge consequent upon disease will be cured by these means alone, and invariably if excited by worms ; but the cause should always be treated and overcome where it can be determined. Moreover, the general health should be attended to, for in most instances it is more or less impaired.

STRUCTURE OF THE VAGINA.

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Cases of sterility are occasionally encountered in which the cause more bands extending across the vagina, and usually located from one inches within.

When these are small, they may be divided with a knife, but if large, by elastic ligature is the safest method.

During the "season" and after the color has disappeared from the discharge, is the most favorable time for the operation, for then the parts are all considerably relaxed.

In most instances the band can be passed by the end of the finger, and hooked with it, drawn near enough to the outlet to permit the use of a knife. But the traction should always be gradual, that the parts may have time to yield; and almost always the bitch will assist with bearing-down or expulsive efforts.

Rarely is any after treatment required, for there is comparatively little bleeding.

Another form of stricture now and then met with occurs at the commencement of the vaginal passage, the opening of which is as tightly closed as that of the rectum, and, as in examinations of the latter, the introduction is resisted, and the finger held quite firmly at the outlet after it has entered.

Sterility exists in this instance also, and can scarcely be overcome except by operation. The safest and easiest is to slowly cut through the muscles that cause the stricture, by means of an elastic cord, as is sometimes done in fistula of the anus.

As a rule it is advisable to make the operation bilateral.

PROLAPSE OF THE VAGINA.

Subjects which have been debilitated by frequent pregnancies, disease, lack of exercise, or from other fault of management, sometimes suffer from prolapse of the vagina. And this accident having happened once is liable to occur again, especially during the "season."

There may be a congenital peculiarity which favors prolapse, but almost always it is due to a relaxed condition and lack of tone in the parts involved.

The trouble can scarcely be mistaken; for the vaginal mucous membrane appears at or protrudes through the outlet, and presents the appearance of a red, soft, easily resisting, shining body, which blocks up the passage.

When the prolapse is recent, the parts can be quite easily restored, and there is a fair chance of their keeping in place; but having been down for several hours, or the accident having occurred several times, it will likely be repeated.

Offensive with warm water, dry by gentle pressure with a soft towel, and oil malady is, ~~ring~~ parts, are the first steps. Then with the fingers, also clean and delivery by those parts should be forced back, gentle pressure being used; but tained ~~and~~ that the return may be gradual. would ~~meanwhile~~ her fore parts should be on the ground and her hind parts or oiled.

The prolapsed parts back into place, it will be advisable to administer an astringent vaginal injection, consisting of about two heaping tablespoonfuls of tannic acid in one pint of water. Only a little of this need be injected, — merely sufficient to drench the internal parts, — and a large glass or hard rubber syringe being used, the pint solution should suffice for three or four injections.

The rule should be to overcome the prolapse by this means as often as it is noted, unless it recurs at once. But where it takes place during season only, and is slight, interference would scarcely be warranted, for the trouble would likely right itself at the end of the period.

As for frequently recurring prolapse, only a surgical operation promises a complete cure.

VAGINAL POLYPI.

Polypi of the vagina are pear-shaped tumors, smooth, shining, quite firm to the touch, and devoid of sensation. Only in rare instances are they found, and in such they almost always form high up in the passage; and their presence is only suspected after they have grown quite large, or are of sufficient length to allow them to reach the vaginal orifice. They then cause considerable discomfort, and give rise to an irritating discharge.

Their removal is easily effected, but only he who is skilled in the use of surgical instruments should undertake it.

INFLAMMATION OF THE WOMB.

Where a dead puppy is retained and badly decomposed, an inflammation of the womb is generally set up. Usually, also, there is blood poisoning or puerperal fever, which by the intensity of its symptoms masks the local trouble. But the womb may be inflamed without poisoning, although instances are rare. Again, an inflammation may occur in it at other periods than those of whelping, the same being produced by sudden chilling, as results from a plunge in very cold water; and the danger of this accident from such cause is much the greatest during or soon after the mating season, while the womb is naturally somewhat

congested. But notwithstanding the fact that no period is really exempt from this affection, seldom indeed does it manifest itself except after whelping, and in consequence of a dead and putrefying puppy.

As practically stated, when associated with puerperal fever the inflammation of the womb is never likely to be recognized. When occurring alone after whelping, it presents symptoms that very closely resemble that grave malady as long as the puppy causing the trouble remains; but that removed, aside from a straddling gait, slight fever, and apparently some abdominal tenderness, there is little to indicate its presence.

The symptoms of puerperal fever, elsewhere described, appearing, and instead of sinking rapidly the strength of the patient keeps up well, and she safely passes the days so fatal in that disease, — the second and third, — hopes can rightly be entertained that the existing trouble is as yet confined to the womb.

Inflammation at other periods than that of whelping is characterized by fever, tenderness over the lower part of the abdomen, frequent and evidently painful attempts to urinate, diarrhoea with straining, and oftentimes vomiting. When standing, the back of the victim is arched, and her hind legs are so spread that her gait is stiff and awkward.

Offensive vaginal discharges after whelping are very generally caused by retained, dead and decomposing puppies, and in all instances the genital canal should be thoroughly explored with the forefinger, the same being first well anointed with sweet-oil or lard.

When the puppy is low down in the canal its presence should be made out, even by an examiner who is inexperienced; but the services of an expert will very generally be required in effecting delivery, therefore the primary examination can wisely be left to him.

The inflammation occurring in the absence of a dead puppy, on examination the womb is found much swollen, and the patient shrinks under the touch of the finger as well as from pressure on the outside, over the womb.

In such cases there is rarely any vaginal discharge unless the inflammation has been on for a long time, when likely a purulent one occurs.

This disease is not of itself one of considerable danger. Indeed, when not associated with pregnancy, it usually begins to subside after a few days, and restoration is nearly complete in the course of a week.

Where there is a dead puppy in an inflamed womb the outlook is serious; for the inflammation is likely to be aggravated by the delivery, and it may extend and involve the peritoneum. But still, if the affected organ can be emptied speedily and without much injury, recovery ought to occur. Instances are also on record in which dead puppies were retained for nearly two weeks, then expelled by the mother, and recovery took place very quickly. But such happy results are rare indeed, and the rule in like cases is that either puerperal fever or peritonitis sets in and destroys the victim.

Used in this instance, the term recovery must be qualified ; for although the health may be entirely restored, the womb seldom returns to its original state after being once inflamed. But, instead, it generally remains permanently enlarged, and there persists a low form of inflammation of its lining membrane. Consequently the victim is not likely to be afterward capable of breeding.

Simple and uncomplicated inflammation of the womb scarcely requires other treatment than good nursing. Rest should be enforced, the patient prevented from taking cold, and the diet restricted to milk and other light and easily digestible foods.

Inflammation occurring shortly after whelping and attended by an offensive discharge, should have the same treatment as puerperal fever. When the affection follows whelping and the signs indicate that the womb is empty, good nursing will generally suffice.

TUMORS OF THE WOMB.

Under this head are included polypi and tumors located in the uterine walls.

The first may form at any time of life, and they may be mucous, glandular, or fibrous ; but of all, the mucous are the most common.

Naturally of slow growth, they often exist for a long time without giving rise to any appreciable symptoms ; and indeed only rarely is their presence suspected until they have passed out of the uterus and attained sufficient size to reach the vulva, where they appear as vaginal polypi.

Tumors of the uterine walls form between the third and fifth years, while the uterus is most active. Small at first they, as a rule, grow slowly and steadily, and after attaining considerable size, cysts or sacs containing fluid generally appear in their substance.

The symptoms of uterine polypi and tumors have some resemblance. In both the early signs are obscure. The first generally observed are manifested during the mating season, which is much prolonged, the bleeding existing in some cases between four and five weeks.

These tumors seem to stimulate the womb, and it increases in size ; consequently in time there is likely abdominal enlargement, which suggests pregnancy in victims that are fairly thin. But as a matter of fact, as a rule, they are usually fat and overweight, therefore until the growths themselves and the womb are quite large the change may not be detected.

On attaining sufficient size they press against the bladder and lower bowel, and as a result there is frequent urination and straining. But these symptoms are not constant, that is, with marked intensity.

With polypi there is also some uterine enlargement, and possibly much the

same symptoms, due to pressure, may be excited ; but rarely, however, are they nearly so severe as with tumors.

Conception is not likely to occur where there is a polypus of considerable size, for it blocks the uterine canal. But a tumor will scarcely do this until quite large, and a bitch may have several litters before she becomes barren. Yet she would not be a sure breeder, but instead, would "miss" often, and occasionally have "false heats." She would also more than likely have some dead puppies in her litters.

When the tumors have become noticeably large and cysts have formed and are about to rupture, the victim manifests peculiar symptoms. She urinates frequently ; her abdominal enlargement seems to indicate that she is about to whelp, while the uneasiness exhibited over her bedding justifies this assumption.

Suddenly there occurs a very profuse vaginal discharge of grayish slime, and this is followed by a little bleeding, which keeps up for three or four days. There is usually, also, traces of milk in the breasts.

During this period the victim acts precisely as when in season and admitted to the presence of a dog ; and if excluded from him, she will roll up her bedding, and on the top of the same give evidence of very intense promptings.

The cysts having ruptured, much of the abdominal enlargement at once disappears, while the attendant symptoms rapidly subside and the patient is soon apparently well. But the tumor generally continues to grow, the abdomen again enlarges, and finally paralysis of the hind parts occurs ; after which it is not long before the case ends fatally.

Nothing can be done in the way of treatment to arrest the growth of tumors, nor is any required when the cysts rupture.

Polypi should be removed by means of a snare, or they may be twisted from their attachments.

CHAPTER V.

PUERPERAL FEVER.

PUERPERAL fever, as the name implies, is a fever that occurs in dams during the puerperal state; that is, while, or shortly after, giving birth.

There may, possibly, be other causes of this malady, but certainly the most common cause is infection.

Formerly it was generally believed that of puerperal infection there was only one variety; but at the present time the popular theory is that there are at least two varieties, one of which is produced by the absorption of the products of putrefaction, while the other is the result of absorption of septic material and germs. And the acceptance of this has led to the selection of the terms putrid infection and septic infection as appropriate for their classes.

Considering at length putrid infection, it is due to putrefactive alkaloids called ptomaines, or to chemical products. It is not contagious or inoculable; nor do germs appear in the blood of the victims.

When produced by ptomaines, it is the result of putrefactive bacteria only; and when occasioned by chemical products, the process and effects are similar to those produced by toxic doses of poisonous medicines.

These in the main are the causes of putrid infection.

Septic infection, on the other hand, is due to germs and their products. These, called microbes, enter the system, multiply, and develop what are termed leucomaines.

It is contagious and inoculable; and in the blood of the victims are found germs similar to those introduced.

The special germs are of malignant potency, and if only a very few gain admission to the system of a healthy subject intense infection will likely result.

Septic infection may be produced by a previous case, and probably by certain other diseases, in which poisoning of the blood is also occasioned by germs.

These in brief are the distinctive features of the two forms of infection.

Recurring to putrid infection, the condition which appears most favorable for that is retention, in the uterus, of dead puppies, after-birth tissues, or blood-clots.

Decomposition occurring in these, ptomaines are produced and absorbed, and there is putrid infection and puerperal fever.

Another cause of this infection may be sloughing and putrefaction of uterine tissue which has been injured, as it might be by instruments employed in delivery.

Did the post-partum discharge not have free escape, putrefaction and all its attendant evils might follow.

There yet might occur other changes in the genital canal, connecting organs or adjacent parts, and the end be putrefaction, absorption, and puerperal fever.

In this class the place or foci of infection is always in the generative organs, and commonly the uterus; and its occurrence must be easy in the presence of putrefaction, for the vitality is lowered, the nervous system deranged and depressed by prolonged labor, and the resistance of the system to noxious matters is thereby greatly reduced.

As stated, in septic infection poisonous germs are introduced into the blood, where they multiply rapidly, develop an alkaloidal poison, and are conveyed to the uterus and other abdominal structures.

Doubtless the generative organs are their avenue of admission, and from them they are taken up by the blood, for when this is properly protected, infection and true puerperal fever does not occur.

These germs may ingraft themselves and redevelop on any abraded surface of the genital tract. But such rarely exists outside of the uterus, except when instruments have been used and parts wounded. On the other hand, the conditions within that organ at the time of whelping are most favorable for them; for a puppy born and its after-birth no longer adherent, there is abundant opportunity for attachment and absorption of germs at the point at which it had been fastened.

Now assuming that one or all of a litter have been born, that the mother was examined during whelping, and the hand used was tainted with only an infinitesimal quantity of the septic germs; so far reaching are they and so great is their virulence, it would scarcely be possible for her to escape infection.

This danger would be even greater were she suffering from or threatened with putrid infection, for matter undergoing putrefaction is a perfect hotbed for germ development. And this fact suggests that although most cases of puerperal fever are the result of septic infection or of putrid infection, and of one form only, there must be cases of mixed infection, or, in other words, cases in which the two forms are combined.

The appreciable symptoms produced by putrid infection and septic infection are nearly identical in cases in which the infection is intense and well advanced, but in their invasions and during the earlier stages there is marked variation.

Considering first a severe case, the following signs are exhibited. A chill occurs and fever is speedily manifested. The pulse is quickened and continues up, as well as gains in rapidity. It is also weak, soon loses volume, and becomes "thin and thread-like."

In some cases the disease speedily involves the peritoneum, and the abdomen is distended. Not, however, to a marked degree, as a rule, although in occasional instances the distention is quite as great as it was before the puppies were born.

With the peritoneum affected it would be natural to expect great tenderness, yet as a matter of fact it is but slight in this disease, nor do the victims appear to suffer considerable pain. But even to the inexperienced eye it is very evident that they are hard hit and in a highly dangerous condition.

Within a few hours after infection is intense their eyes seem to have sunken in their sockets and wear a hopeless expression. They are greatly prostrated; require much urging to change their positions; seem to have difficulty in breathing, the same being rapid; and in manner they are dull, listless, and indifferent to all going on about them.

Generally on the second day after the disease is on in full force the extremities become cold and are covered by a clammy sweat; the pulse barely flickers; there is collapse; and usually death takes place on that or the following day.

The local signs of the malady are even more pronounced than these, and can scarcely be mistaken. Even at the time of whelping there is an odor that is suggestive of the trouble. This comes from the discharge, which speedily grows more offensive, until it is an intolerable stench. The discharge is also often so profuse that the patient and her bedding are almost flooded with it; and to add to the loathsome condition of things, vomiting and diarrhoea likely set in, the latter being characterized by dejections that are intensely foul smelling, and usually quite black, although they may be of yellowish color.

These are the signs manifested in the most severe attacks, whether of putrid or septic infection, but, as said, there are decided variations in the invasions. For instance, septic infection occurs with great rapidity, and grave symptoms are speedily ushered in within a few hours after the first sign appears; seldom indeed being delayed beyond a day. Moreover, almost every attack of this form of the disease is of terrible intensity. But, on the other hand, putrid infection is generally slower, while the invasions are milder; and although it may eventually produce all the appalling symptoms of which the other form is capable, such result is much less common. And in not a few cases the amount of poisons taken up by the blood is sufficient merely to produce for a few days lassitude and depression, with but slight fever.

Assuming that the uterine cavity contains material undergoing putrefaction and being absorbed, or, in other words, that putrid infection is taking place, there is first chilly sensations or a distinct chill, followed by fever; but instead of the latter being high soon after it sets in, it generally increases gradually; the pulse gains somewhat slowly in rapidity; and lassitude and other symptoms of the nature of those of intense infection are much less marked and comparatively slow to acquire great severity.

When puerperal fever is the result of septic infection its symptoms are generally too pronounced to be mistaken on the second day after whelping. They may, however, be manifested in great intensity on the first day, or much less often be delayed until the third day. But when the cause is putrid infection, its evolution being much slower, the fever and associate symptoms are, as a rule, seldom appreciable to the ordinary observer before the third day; and they may even be delayed until the fifth or sixth.

In the development of complications there is also a notable difference between the two forms of infection. As a result of the septic, the pelvic organs are speedily involved; whereas, while it is possible for the putrid to produce any and all the complications of which the septic is capable, such unhappy result is not the rule.

Puerperal fever may rightly be considered one of the most serious maladies with which dog breeders are obliged to contend; and all cases considered, in much the largest proportion death occurs. Of course in very many instances the chances of recovery depend greatly upon the cause and treatment applied, yet in not a few the unhappy end is in sight from the first, and medical skill utterly powerless even to delay its coming. These cases are largely made up of those in which septic infection has occurred, the rule being with them that the poison in the blood is of such extreme virulence or in such overwhelming quantities that the victims succumb before the second or third days.

Were the proper treatment applied promptly in all cases of putrid infection the mortality from it would be infinitely less than now. And indeed spontaneous recovery without medical intervention is not very infrequent, the putrefying mass in the uterine cavity being voluntarily expelled. While in many cases local treatment has the happiest effects, — removing the infectious material, and thereby arresting absorption before the quantity of poison taken up is sufficient to destroy life.

Wise treatment will do this and save life in most cases of puerperal fever caused by putrid infection, but now and then, complications speedily occur in the pelvic organs, and the outlook is well nigh hopeless with their advent.

Puerperal fever manifesting itself, the first steps should be to remove the puppies from the breast, give them to a foster if one can be obtained, and then determine if possible if there is infectious material, as a dead puppy, in the genital canal. And it follows that if anything is found there it should be promptly removed to prevent any further production of blood poisoning. But even so large a mass as a putrefying puppy may be lodged in the uterus and yet not be detected by the ordinary examiner. Again, although one is with certainty made out, speedy removal of it may be impossible. Consequently in all instances where nothing is found in the uterus or passage from it, or there is a mass in the former which cannot be at once removed, those parts should be deluged with a disinfectant without delay.

Corrosive sublimate is the agent to be used, and in solution with water in the proportion of 1 to 2,000.

This remedy may be obtained of druggists in the form of tablets, with full directions as to the quantity of water in which each should be dissolved to make the solution of the right proportion.

The best instrument for its application is a "fountain syringe." This filled with the solution, heated to not less than 105° F. and not over 115° F.,—a thermometer invariably used,—a little of the fluid being allowed to run out by the tube, that all the air may be expelled, the tip or nozzle should be gently inserted in the passage to the uterus, as far as it will go, and the injection allowed to flow until it comes away as colorless as it entered, the syringe being refilled as many times as necessary.

The next step is to wash away all that remains of the disinfecting solution, for the corrosive sublimate is an intense poison and might be absorbed. But all danger of that can be obviated by a copious injection of water, which must always be as hot as the solution first used.

This having been administered, if the water injected has returned with quite an offensive odor, still another injection should follow ; and that should consist of one or two cupfuls of carbolic solution, made by dissolving one drachm of carbolic acid crystals in a pint of water, the latter being of the same degree of temperature as the other injections.

During the first day and until improvement is noted, these injections should be repeated once in every six or eight hours. And after each the patient should be gently lifted onto clean dry bedding.

Laymen might administer the injections, but it were infinitely better that they be intrusted to the family physician, for the reason that he can make them intra-uterine, and thus attain the greatest possible effect.

He will wisely attach a gum elastic catheter or piece of small rubber tubing to the nozzle of the syringe, and carry the same to the top of the womb. And this operation he should find as easy as in his own practice.

A speculum will not be required, for the os uteri can be made out, it being a finger's length from the vulva in bitches of large breeds.

Thorough disinfection of the vaginal canal and womb is essential in all cases of septic as well as putrid infection, for, as already urged, it is by this gateway that the trouble enters ; and while the results of such treatment would be most beneficial in the latter, in cases of the former there would doubtless be some germs yet unabsorbed, and manifestly they should be destroyed or washed away. It is obvious, moreover, that could this treatment be applied in the beginning of septic infection it would prove quite as efficacious as in the putrid form.

Recurring to the injunction to use a disinfectant in all cases whether or not there is infectious material in the womb, it is again urged that were any such material therein it should first be removed; for but little can be expected of the

disinfectant while that remains, even if the solution is carried into the womb, which is never likely unless the injection is administered by a physician. Yet it should do some good, slight though it be, when used by non-professionals, and in a measure delay absorption, prevent the victim from losing ground rapidly, and favor the chances of natural or forced expulsion.

Ergot is a uterine stimulant, and under certain conditions it acts admirably on the human family. On the canine, however, its effect is much less marked, and it is practically valueless in puerperal fever, for which it has often been prescribed, under the impression that by means of it the uterus can be made, in some degree, to free itself of retained material. But this is a delusion; for while that organ might be stimulated somewhat by the drug, the results would be disappointing, for in such cases the uterine contractions are irregular, and obstruct instead of favor expulsion of matters retained.

Quinine and calomel should be the main reliance in the way of constitutional treatment, and these should be combined as follows:—

Take of calomel ten grains and quinine eighty grains. Mix and divide into ten powders if the patient is of medium or large size, or into twenty powders if under medium size.

One powder should be given every four hours; and caretakers will find the administration easiest if capsules are used.

When there is high fever, it is advisable to resort to some antipyretic, and one of the safest of the most powerful is phenacetin, one or two grains of which, according to the size of the patient, might be given, with every powder of calomel and quinine, until the fever has greatly subsided.

This should be the medicinal treatment until the end is certain, or marked signs of improvement are noted.

From the very first, measures must be directed to the support and stimulation of the system, that it may make a good fight against the invading poison, and they should consist of as near absolute rest as possible, forced feeding, and the administration of whiskey.

Milk and raw eggs stand high on the list of serviceable foods, and with them meat extracts and meat jellies. The latter, however, must not be confounded with beef-tea, but should consist of the juices expressed after the meats have been heated only slightly—not cooked.

The nourishment must be administered every two or three hours until improvement is noted. And the whiskey should be given at equally as short intervals, and preferably between the feedings. As for the doses of the stimulant, a tablespoonful for largest breeds and a teaspoonful for the smallest can be none too much. The fact must also be kept in sight that dogs will bear in this much greater quantities of stimulants than in ordinary diseases, therefore if there is a sign of rapid failure, even larger doses than those advised would likely be indicated.

In view of the fact that in puerperal fever the intestinal discharges are usually highly offensive, also that nature then sends diarrhoea as a measure of relief, it is advisable to give early in every attack a moderate dose of magnesia, and repeat every fourth hour until the bowels have moved freely.

Other medication will seldom be required in puerperal fever, except it be to combine the carbonate of ammonia with the whiskey after the first day, if failure of the vital powers is threatened.

This should be in solution with water, one and one-half drachms to two ounces. The dose will then be one teaspoonful for medium and large-sized dogs, and one-half that quantity for the smaller.

Summarizing, the treatment required is to empty the genital canal; wash it out and keep it clean with corrosive sublimate solution; meet the offensive odor with carbolic solution; favor the removal of the *materies morbi* from the system by the remedies advised; and literally "crowd" nourishment and stimulants; for the poor victim is, as it were, in deep water, and if her strength is kept up it is possible that she may make a safe landing.

That in many instances puerperal fever is preventable is a fact that can properly be urged in closing, although such must be the inevitable conclusion from the foregoing. Remembering always that it is through the genital tract that infection occurs, whether it be septic or putrid; that the special germs are of the most virulent nature, easily transmissible, and only an infinitesimal quantity is quite sure to prove destructive; that retained matters must decompose before they become infectious, and bacteria are necessary to putrefaction; finally, that these essential agents may be on the person of caretakers, — it follows that ample precautions should be taken before making examinations, lest the poisons be introduced.

These precautions consist first of thorough cleanliness of the hands, secured by a scrubbing-brush and soap and water, and a subsequent use of a 1 to 3,000 solution of corrosive sublimate, or 5 per cent solution of carbolic acid.

That in all instances the whelping quarters should be the healthiest possible goes without saying. If always clean, dry, well-ventilated and accessible to ample sunlight, with the precautions advised, puerperal fever is never likely to enter them.

As for the measures which must be employed to prevent its recurrence where this malady has once invaded kennels, they will be discussed with Septicæmia of Pregnancy.

CHAPTER VI.

SEPTICÆMIA OF PREGNANCY.

CONFINING the use of the term to proper limits, puerperal fever can only occur after labor has set in; and seldom does it attack mothers before delivery is nearly if not quite completed. The disease about to be discussed so closely resembles that fever it has been considered identical, and therefore given the same name. But this is manifestly wrong; for while they have many features in common, there are yet some that are at variance to such a marked degree they must be accepted as distinct affections. Consequently it becomes necessary to coin a name, and the propriety of that chosen will appear anon.

Septicæmia of pregnancy, like puerperal fever, is a disease produced by septic matter which has entered the blood. But while the latter occurs only after labor has commenced, the former attacks its victims during pregnancy; and they are either destroyed before they have reached the time for whelping, or the destructive work has then so far advanced that they die in labor or shortly after it has been completed.

The primary cause of this septicæmia is, without doubt, some form of microbe, which enters the blood and is conveyed to one or more fœtuses, which die; or it develops a virulent poison that is passed on to the uterus with the same disastrous effect therein. The fœtus or fœtuses destroyed decompose, and as a result there is putrid infection and blood poisoning, as in puerperal fever.

This microbe, which is evidently the primary cause of septicæmia of pregnancy, obviously is not the same as that which is capable of producing puerperal fever. Where the latter occurs, infection enters by the way of the generative organs, and when they are properly protected that peculiar fever is impossible; but in the former it would appear that the germs must invade the body by the way of the nose or mouth, then make their way into the blood, from which, as stated, they, or the toxin produced by them, are conveyed to the uterus, on the contents of which their force is inflicted.

Appreciable signs that something is wrong, and which may suggest this septicæmia, are not as a rule manifested until two or three days before the victims are due to whelp, although in occasional instances they have been noted a week, and even nine days, in advance of that eventful period. On the other hand, in some cases whelping has commenced before the occurrence of symptoms that excited suspicion or apprehension.

The first symptoms are generally vague and ill defined. Indeed, they vary but little from those that bitches about to whelp oftentimes exhibit, and which are induced by the first pains of labor. That is, the unfortunates likely have less spirit than usual, are not so much inclined to exert themselves, and keep closer to their kennels; and while they may eat fairly well, their appetite is none the best.

In most cases whelping at least commences, and it may stop before the first pup is in the world, or at once it is delivered, or persist until only one remains in the uterus, — all depending upon the existing conditions, — and there is a bare possibility of its going on to completion.

Where only a part of a litter has been destroyed, and the living are behind the dead, the mother is never likely to voluntarily give birth to any, although she may have labor pains for a short time.

With but one dead puppy that had presented first and been removed, labor pains would scarcely come on again with any intensity, and the delivery of the remainder of the litter would almost always require force.

With only one dead puppy in a litter, and that placed last in the uterus, the mother might unaided give birth to the living; but this is contrary to the rule, which is that they must be taken away, and the removal of the last is then always a matter of exceeding difficulty.

One or two dead puppies in each litter has been the common experience, but now and then this disease kills all, the mother as well as puppies, before the labor pains begin. And this result seems to be invariable in cases in which the attacks are well on a week or more before the victims are due to whelp.

The conclusive signs of this disease — that is, the symptoms, which are produced by it after the septicæmia is advanced — are identical with those of puerperal fever. And indeed where whelping has commenced, the labor pains have ceased, and dead and putrefying puppies are retained, the case has become one of that fever.

When septicæmia occurs with an intensity which proves fatal to mother and puppies several days before the period of whelping is due, the victims, as a rule, are noticeably ill only one or two days. They droop as it were, eat but little or refuse food altogether, are disinclined to move about, and generally die quite suddenly.

Mr. Everett Millais, of London, England, had the misfortune to suffer from an epidemic of septicæmia of pregnancy in his kennels, and he generously placed a record of his cases at the disposal of the writer. They in brief were as follows: —

1. The victim was due to whelp Oct. 6, 1890. First signs of labor appeared Oct. 8. Pains ineffectual, and puppies were removed. All dead and in an advanced stage of decomposition. Mother died on the following day.

2. Due April 4, 1891. After being dull and languid for three days, was

taken quite ill April 1. Death occurred suddenly the next day. Mother opened immediately. Five living and two dead puppies removed; the latter much decomposed; the former lived two days.

3. Due July 3, 1892. Taken ill June 30. Labor started July 1. Pains soon subsided. Mother in very critical condition. Six puppies quite speedily removed, four of which were living. The others decomposed. The following day the mother failed rapidly. Another dead and very putrid puppy removed. Death occurred that night.

4. Due Jan. 28, 1893. Natural birth, at term, of eleven puppies, two of which were dead. Mother very ill for three weeks, but eventually recovered. If this was a case of septicæmia it is assumed that recovery was due to the power of the mother to whelp before much septic matter had been absorbed.

5. Due July 14, 1893. Taken ill July 5, and died in convulsions on the following day. Autopsy revealed nine decomposing puppies.

6. Due Aug. 15. On that day signs of whelping appeared after the mother had been "moping" for two days. Efforts at natural delivery were feeble, and soon ceased. Six living puppies were removed, and the day following another — very putrid. Mother died Aug. 19.

7. Due Sept. 15, 1893. After being very "mopy," and "off her feed" for two days, the mother died suddenly Sept. 10. Seven putrid puppies found at the autopsy.

8. Due Sept. 24, 1893. Whelping commenced on that day, after the mother had been dull for a day or two. Yet she had eaten and taken exercise. One dead pup was born and then labor stopped. It was believed that another dead puppy blocked the way of several living puppies; and as a natural delivery appeared impossible, efforts at removal were made. They proving ineffectual, and the mother being nearly dead, chloroform was administered. On opening her ten living puppies were found and removed from behind a puppy that had much decomposed.

Scarcely ever, if ever, can mothers be saved when once this malady is on them; and the puppies must also succumb unless they are promptly removed. But removal is never easy. In fact, it is always exceedingly difficult and wearisome. And since only comparatively few veterinarians have an intimate knowledge of dogs, for the operation to be successful it must generally be performed by a physician.

Where dead puppies precede the living, the chances of removing the former in time to save the latter are seldom good; and in most cases the mothers must be sacrificed. There being no alternative, chloroform should be administered, the abdomen and uterus opened, and the puppies removed.

Only a very small proportion of the little ones so released are likely to live; yet if at once enveloped in hot blankets, gently rubbed to life, and speedily given to a foster, there are chances of their doing so.

When possible to effect delivery through the natural avenue, the uterus being freed of its contents, it should be thoroughly disinfected, as in puerperal fever.

As to constitutional treatment, at once the presence of the disease is detected, the same medicine, stimulation, and supportive treatment recommended for puerperal fever should be administered.

Recurring to disinfection, some physicians have greater confidence in the peroxide of hydrogen than in corrosive sublimate or carbolic solutions. The former can be used freely and is entitled to preference, provided the uterus is empty and its mouth so well opened that the drainage is good.

Once this disease occurs in a kennel, only with exceeding difficulty can it be made safe for bitches in whelp. Indeed, he is wise who, having had a case of it, burns the infected quarters; or, if this remedy is too expensive, purifies them as completely as possible, devotes them to general use thereafter, and provides others for whelping.

If neither of these radical measures can be applied, then all that remains is to disinfect thoroughly. If the floor is of wood, it had best be removed and a new one laid down. But before this is done a large quantity of quicklime should be spread on the ground beneath and spaded in. At the same time, if the air cannot circulate freely under the floor timbers, two large holes should be made in the foundation, on opposite sides, and left open for weeks and even months, if possible.

Before the floor is relaid, its timbers and the foundation walls should all be treated to a solution of corrosive sublimate, made by adding a teaspoonful of that agent to a gallon of water. This should be driven with a brush into every crack and cranny, or if there are any that cannot be reached by this means, a syringe should be used.

Allowing a day or two for this solution to thoroughly dry in, it should be followed by a lavish use of quicklime in the form of thick whitewash; which is most active when applied as soon as prepared and while still hot.

All this done, the ceilings, walls, and indeed every part above should be as faithfully washed with the same corrosive sublimate solution, and this again in turn be followed by whitewash where its use is permissible.

Of course if a kennel is of expensive construction, and its walls are sheathed and painted, the owner would be reluctant to whitewash such parts, in which event he should paint, varnish, or shellac, as he may prefer, after the sublimate solution has been freely applied.

A temporary floor having been in use while this renovation has been going on, a permanent one may be laid; and thereafter, until the quarters are to be again used, every door and window in them should be kept open day and night, to admit the sunlight and air, — two of the most potent disinfectants.

SECTION VI.
DISEASES OF THE EYE.

CHAPTER I.

OPHTHALMIA.

AN inflammation that is general and affects more or less the whole eye is termed ophthalmia. Although mild forms may occur and recovery take place speedily and completely, in the majority of cases the disease runs a violent course, restoration is always slow, and the sight is often permanently impaired if not entirely destroyed.

Conjunctivitis is present, and in the worst infectious forms it is of purulent type. The nose is hot, the eyelids are much swollen, pain is intense, and greatly increased on exposure to strong light. There is more or less fever. Lassitude, prostration and other signs of constitutional disturbance are also noticeable.

As a rule the cornea is affected and loses much of its transparency; while if deeper parts are involved, the cornea also appears reddened, and the pupil cannot be made out.

The common cause is a direct injury, as a blow, or from a tooth in fighting.

In the absence of professional aid, the first requisite for treatment is cleanliness, which should be effected hourly by means of tepid water and a soft sponge, cut in the shape of a wedge, the thin edge of which should be used to enter between the lids.

After the eye has been well washed and all trace of the discharge removed, a solution of borax and camphor water, ten grains to the ounce, should be dropped into it; and at night the lids should be lubricated with vaselin or sweet-oil, to prevent their sticking together.

As a rule, it is well to give the patient a brisk cathartic, and restrict his diet to liquids until the inflammation is on the rapid decline.

In severe cases, which may be considered to be infectious, great care should be exercised to prevent the discharge from entering the uninjured eye, and the sponges be always burned after use. Boric acid, fifteen grains to one ounce of distilled water, may be used if the milder borax solution is not thought sufficient.

The degree in which the various parts of the eye are affected varies much,

and a non-professional would not likely be able to discriminate between those cases which promise to run a mild and innocent course and those which threaten to seriously injure or destroy the eye; consequently the treatment advised should be faithfully employed in all cases.

CATARRHAL CONJUNCTIVITIS.

The mucous membrane which covers the eyeball and lines the inner surface of the lids is called the conjunctiva, and inflammation of it conjunctivitis.

Of this affection there are several forms which can properly be considered herein, namely, the catarrhal, purulent, and chronic.

Catarrhal conjunctivitis, which as a rule affects both eyes, is popularly known as a "cold in the eye." It may be caused by long exposure to a strong wind, by dust or other irritating particles lodging in the eye, and by injuries, as scratches from twigs or bushes, and from blows. A plunge into very cold water or exposure in very bad weather may have the same effect; so, too, eyelashes which have turned inward and constantly come in contact with the eyeball. Acrid vapors, such as arise from the chloride of lime and a few other disinfectants, are also capable of producing it. In distemper this inflammation is manifested early; and it is apt to occur during the course of other intensely acute diseases.

In simple rhinitis with coryza, or cold in the head, and acute bronchitis, the conjunctiva generally shares in the catarrh of the air-passages; but seldom is it very severe in such cases or of other than short duration.

An eye that is affected with catarrhal conjunctivitis presents the following appearance: It is more or less reddened, and the lining of the lids is of deeper red than normal. In extreme cases also it appears velvety. There is usually some swelling of the lids, and the mucus and tears flow in such quantities as to keep the eyes suffused. The patient blinks and drops his head in strong light; and when there is considerable irritation and itching, he attempts to overcome it by rubbing his eyes with his paws.

There are, however, various types of conjunctivitis. Thus, there may be merely a little mucus gathering in the corner of the eye, the same sticking the lids together, and so little redness that the existing inflammation is unappreciable except to the practised observer.

In catarrh of the eyes, as in many other affections, there is a natural tendency to self-limitation and recovery; and when the attack is mild it may largely be left to nature, the medicinal treatment being limited to the application of simple cerate, vaselin, sweet-oil, or cold cream to the edge of the lids along the eyelashes, to prevent their sticking together.

On the other hand, in a severe case, in which the lids are swollen and very

sticky, the eyes quite red and the discharge profuse, treatment should be prompt and energetic. Frequent douching of the lids with tepid water will be necessary. The diet should be restricted to bland foods; the bowels freely moved by a purge, and the patient kept in a room in which the light is dim or entirely excluded. But at the same time good ventilation must be afforded.

If medical advice cannot be immediately obtained, a solution of borax in camphor water, ten grains to the ounce, should be dropped into the eye — onto the eyeball, the lids being forced apart — every hour while the disease is intense. This can be done by the means of a clean teaspoon, although a glass “dropper” is more convenient. As for the quantity, a few drops will suffice. At night, when the douching must be discontinued, the lids should be well lubricated with vaselin.

If under this treatment some improvement is not noted in the course of three days, for the borax and camphor water, a solution of sulphate of zinc — two grains to an ounce of water — should be substituted, and dropped into the eyes three times a day.

As stated, this disease is self-limited; therefore the object of treatment is rather to keep down the inflammation and make recovery easier, than to attempt to effect a speedy cure.

Blisters are never required, for they are of no use. Poultices of all kinds are very dangerous here, and should therefore never be applied in this or other affections of the eyes.

PURULENT CONJUNCTIVITIS.

Fortunately this affection is unmistakable and quite rare. It occurs suddenly, and begins as a catarrh; the eyelids are red, and usually so greatly swollen that they can scarcely be separated. They are soon glued together, and when pulled apart, pus flows in considerable quantity. The eyeball is intensely red, and its surface membrane, the conjunctiva, swollen to such a degree that it forms a ring around the cornea, aptly termed “the window of the eye.” The cornea becomes dull in the centre, and in some cases exhibits ulcers or tendencies to ulceration. This opacity or cloudiness of the cornea gradually increases, becomes darker, and eventually takes on a yellowish-gray coloration. There is marked intolerance of light, and constant winking and blinking.

True conjunctivitis of this nature is very generally the result of the introduction into the eye of specific infectious substances, purulent secretions, or virulent particles floating in the air; yet it may occur in the course of chronic catarrhal conjunctivitis, without poisoning from other sources.

Medical advice should always be sought at once for this affection, because there is liability of permanent injury; but if it cannot be obtained, about all that can safely be attempted is to keep the eye as clean as possible by frequent

bathing with tepid water, and, the lids being forced apart, to apply to the eyeball every hour a solution composed of borax four grains, boric acid twelve grains, and distilled water one ounce.

That the case under treatment is highly contagious must be kept in mind, the rags or bits of sponge used in bathing be destroyed, and cleanliness of the hands so carefully maintained that the eyes of the caretaker cannot be infected. Of supreme importance is the isolation of the patient, which should be promptly effected, for he is a menace to his kennel mates; and he should be kept in a room that is well disinfected.

CHRONIC CONJUNCTIVITIS.

Both catarrhal and purulent conjunctivitis may terminate in chronic inflammation, but such result is not common. Indeed, it but rarely occurs excepting in dogs which are ill-kept and suffer from a low state of general health.

In this affection the lids remain red and swollen, and the eyes are irritable and weak.

Cases of inflammation of deeper parts of the eye—which are more serious and require different treatment—may be mistaken for it, and medical advice should therefore be sought early. Some reliance may be placed on mild astringents, as alum—two grains to an ounce of water—dropped into the eyes several times daily. In the more severe cases the outer surface of the lids may be painted every five or six hours with a solution made by adding two drops of Goulard's extract—solution of subacetate of lead—to an ounce of water, a camel's-hair brush being used; while at night the edges of the lids should be coated with vaselin, cold cream, or some bland, unirritating oil.

The following ointment will often effect a cure more speedily than any other application: Of five per cent solution of corrosive sublimate, one drop; hydrochlorate of cocaine, two grains; vaselin, sixty grains. Place a little of this in the inner corner of the eye,—on the eyeball,—close the lids and gently rub the outside of them for about two minutes.

As the general health is usually poor it must be built up by generous feeding and hygienic means, such as exercise out-of-doors for a few minutes each day, proper ventilation of the kennels, and absolute cleanliness; while the bowels should be kept regular, the digestion active, etc.

KERATITIS.

Inflammation of the cornea, or keratitis, when localized and not associated with inflammation in other parts of the eye, is generally caused by direct injury,

such as a blow, a scratch from thorns, or from the presence of a foreign body which has lodged in the eye.

In mild cases the cornea loses its transparency and becomes cloudy and opaque; while with some types of the affection ulcers are often present.

In the first instance the eyes are very watery and the affected cornea has a diffuse grayish-blue or grayish-white coloration. Its surface also appears slightly irregular and uneven.

Where ulceration occurs in the cornea there is the same cloudiness and opacity, and similar coloration; the eyes are also watery; they are very sensitive to the light, and the discomfort is greater.

In occasional cases the ulceration becomes so deep that the eye seems to burst, perforation of the sclerotic membrane occurring, and allowing the contents of the anterior chamber of the eye to escape through the opening.

The resulting opacities may become entirely absorbed in the course of time, though this is contrary to the general rule; which is, that while they may lessen considerably in extent, they yet persist as dense white spots. Opacities which form in severe attacks of distemper, and occasionally in other constitutional diseases, are, however, notable exceptions, because in such cases, being quite superficial, the cloudiness usually clears up quickly and without medical interference.

Where corneal opacities threaten to be permanent it will be well to use eye-drops composed of the oil of turpentine, one part, and oil of almonds, two parts. The lids being separated, one drop should be allowed to fall on the eyeball; and one application be made daily. It may prove too stimulating in an occasional case, and excite considerable inflammation; in which event the proportion of the oil of almonds should be increased.

Superficial ulcers may heal and leave no trace; but generally they also produce permanent opaque spots.

Where perforation has occurred there is adhesion of the iris and lens to the posterior wall of the sclerotic membrane, or other marked change from the normal, which it is not possible to entirely overcome.

The corrosive sublimate ointment advised in Chronic Conjunctivitis, and applied in the same way, should be tried in corneal inflammation. That failing to have good effect, unless further medical treatment can be applied or directed by a professional, dogs with uncomplicated corneal inflammation or ulcers should be left to nature to effect a cure, being in the meantime kept in good healthy quarters, well fed, confined during the day, and exercised at night.

ABSCESS OF THE CORNEA.

The outermost tunic or covering of the eye is called the sclerotic membrane. This is really composed of two different membranes; one of which forms the

anterior part, the so-called cornea. That is the toughest membrane of the eye, and, unlike the other portion, is transparent, so as to permit light to enter; and is aptly termed "the window of the eye."

There are several forms of inflammation of the cornea which may result from contusions or bruises; and now and then abscesses follow such injuries. Sometimes, also, they occur as complications in severe attacks of conjunctivitis. Not infrequently they form during distemper; and in some instances they appear without appreciable cause.

When an abscess of the cornea is forming, there is intense pain and such intolerance of light that the victim scarcely opens his eyes, and stoutly resists their being examined. The flow of tears is very profuse indeed.

On examination, the cornea is found to be of a gray or yellowish color, and at some point there is exhibited a spot, often but little larger than a pin's head, around which the discoloration is deeper, and which from its appearance quite plainly suggests the nature of the existing trouble. Where the abscesses are large they very generally break and leave open ulcers. Small abscesses may also pursue this course; oftentimes, however, they do not "come to a head," but are absorbed without breaking. In which cases dense white spots are left in their places. These contract in time, but are never entirely obliterated.

If discovered early, and its true nature is clearly defined, under cocaine an abscess should be lanced, with generous incision that reaches to the bottom of the trouble.

The after-treatment should consist of the use of antiseptic lotions, to secure perfect cleanliness, corrosive sublimate gauze for coverings, and iodoform or calomel as dusting powders.

Where the abscesses break, the treatment is essentially the same as for ordinary ulcers of the cornea.

IRITIS.

The iris is the muscle which surrounds the "pupil," and is called the "colored part of the eye." It corresponds to the "stop" or diaphragm of a camera, and serves the same purpose. In its centre there is an opening which constitutes the "pupil."

Inflammation of the iris is fortunately not a common disease. It may occur as a complication of other diseases of the eye, but the usual cause is traumatism or direct violence, by blows or injuries.

The symptoms to a considerable extent resemble those of catarrhal conjunctivitis, but the pain is, as a rule, much more severe. There is also a change in the pupil that is quite characteristic. The normal or healthy pupil will open and close; that is, the iris dilates and contracts under certain conditions. In

this affection, however, if the lids are covered for a moment and then suddenly exposed in strong light, the pupil does not move, whereas in the normal eye it contracts. In the early stage of inflammation the iris appears blurred and less distinct than usual; its color is very different from that of the unaffected eye, and there is a slight dimness of the cornea. The pupil is small, and its inner edges are irregular; while in the next stage, which follows the first quite speedily, the iris assumes a rusty appearance, and a film closes over it.

A full recovery from this affection takes place in a small proportion of cases; but in the majority, vision is sooner or later seriously impaired or wholly destroyed.

As soon as a diagnosis is made, a brisk cathartic should be given, and until local improvement is noted, the patient should have a liquid diet.

A solution of the sulphate of atropia in water, two grains to the ounce, ought to be used locally; for it lessens the pain, contracts the blood-vessels, relaxes the ciliary muscles of the eye, and dilates the pupil; which latter if not dilated would be permanently contracted and fixed by adhesions.

A drop or two of this atropia solution should be dropped on the eyeball, while the lids are being held apart, two or three times daily.

If the patient resists the use of the remedy, it will be sufficient and more convenient to drop the solution into the inner corner of his eye, — near his nose, — and open the lids gently afterward. A shaded but well-aired room should be provided for all suffering from iritis.

CHAPTER II.

GRANULAR LIDS.

A FREQUENT consequence of neglected catarrhal inflammation of the conjunctiva of the eye is known as granular lids, an affection in which the lining membrane, instead of being of the natural color, is of deep red hue and velvety appearance, with elevations, or what seem minute bodies, so-called granulations, which have aptly been likened to the spawn of fish or frogs.

The bacterial origin of this disease is accepted by many authors. It is rarely met with except in dogs in poor general health, ill-fed, and otherwise abused. If unchecked, the conjunctiva becomes thickened, the cornea ulcerated or cloudy, and vision much impaired or almost wholly destroyed.

Treatment should be administered by a physician; but a solution of the sulphate of zinc, two grains to one ounce of water, can be advantageously dropped into the eye several times daily. At night the lids should be lubricated with some simple ointment.

The application of more powerful remedies, sulphate of copper crayon, or alum in stick form, will probably be necessary. Antiseptic washes containing boric acid, eight grains to one ounce of distilled water, or eucalyptol in hamamelis water, a teaspoonful to a gill of the latter, are valuable.

BLEPHARITIS CILIARIS.

Dogs that are ill-kept, especially in filthy kennels, and are poor in health, sometimes have the edges of their lids inflamed and covered by a thick secretion which forms crusts about the roots of the lashes. This affection is also observed as a sequel to severe and prolonged diseases, of which distemper is a notable illustration.

Cleanliness is of great importance in the treatment, and can best be attained by bathing the lids with an alkaline wash made by dissolving one teaspoonful of common baking-soda in a pint of tepid water. This should be used upon linen rags, by rubbing the lids until the crusts are all removed. Then, after drying, vaselin or cold cream should be applied. In severe cases, and in all of long standing, simple ointments will not be powerful enough, and one composed of

the nitrate of mercury ointment, one drachm, and vaselin or lard, two drachms, should be applied after cleansing. As this ointment is irritating, it ought not to be allowed to enter the eye. The most convenient means of application is a swab made of a little cotton wound around the tip of an ordinary wooden tooth-pick.

In general eczema of long standing the eyebrows and lids of the victims usually become eczematous, and in consequence of this extension of the skin disease there is often ulceration of the lids and loss of the lashes as well as of the hair on neighboring parts.

Local cleanliness should be insisted upon in these eczematous cases, and sulphur mixed with lard applied freely. When this fails to effect a cure, the mercurial ointment, diluted as advised with twice its weight of vaselin or lard, should be used.

Animal parasites sometimes infest the roots of the eyelashes and cause obstinate itching, which excites scratching, and thus a local eczema is produced. The same mercurial ointment is the remedy for this eye affection.

ENTROPION AND ECTROPION.

Entropion is a deformity of the eyelid which causes it to curve or turn in, so that its edge or lashes come in contact with the eyeball, and by pressing upon its delicate structures induce constant irritation or serious inflammation.

It occurs quite frequently among bulls, Newfoundlands and setters. Now and then it is present at birth. Occasionally it follows inflammations of the lining membrane of the lids, — the conjunctiva — and sometimes results from the use of caustic substances in the eyes or injuries to the lids that destroy their natural curvature, which in the healthy eye is admirably and exactly adapted for the protection and comfort of the eyeball.

The upper lid is more often inverted than the lower, but both may be affected, and even in the same subject.

Besides the annoyance and discomfort caused by entropion there is constant irritation. The eyes are watery; a grayish mucus accumulates in the corners of them; there is frequent winking; and at times the eyes are shut tightly. The lashes adhere; and while sleeping, often the lids are glued together. Roughness of its surface and inflammation of the cornea are frequently associated.

Individual lashes are sometimes displaced without any particular curvature of the lids, and if these are repeatedly drawn out the fault may be in time overcome.

Some injuries of the lids are of so destructive a character that their results are irreparable. As a rule, however, surgical operations for the relief of entro-

pion are successful in a goodly proportion of cases. But since they are the consequences of disease or injuries, and not primary affections, it would be too much to expect the pleasing results that might be obtained were treatment addressed to original affections. There are several operations for entropion, but the most common is excision of a portion of the skin from the eyelid. When the edges of the wound are stitched together the lid is drawn outward, and generally remains so, although relapses may occur.

Ectropion is a turning out of the eyelid from the eyeball.

The trouble is usually on the lower lid, and may be the result of wounds or burns of the skin under the eyes, and loss of tissue, which causes subsequent contraction in healing and a pulling downward of the lid. It may also be the consequence of severe and prolonged conjunctivitis.

The affected lid is turned out, so as to show its lining membrane, which is reddened and inflamed from exposure to the air, dust, etc. The eyes are watery, mucus collects in their corners, and tears fall down over the cheeks.

Only in recent and very mild forms of the affection are favorable results likely to be obtained by means of medicinal treatment. That failing, an operation would be necessary. The former consists in "touching" the connective tissue of the eyelid with the nitrate of silver or sulphate of copper. It must necessarily be done by a physician; and it were better always that he at once remove a portion of the eyelid without trying this experimental treatment, which does not promise well.

PTERYGIUM AND SYMBLEPHARON.

Pterygium is a triangular-shaped thickening of the mucous membrane covering the eyeball and enlargement of the blood-vessels situated in one or both corners of the eye. From its fancied resemblance to the wing of a bat that name has been given it, the word meaning "little wing."

Although it may arise independently of any general inflammation, it is usually the consequence of conjunctivitis.

It can be quite easily removed by a surgical operation, but it is never advisable to interfere unless it grows upon the cornea, and thus obstructs the vision.

Symblepharon is the name given to a condition in which a portion of the lids have grown to the eyeball. This is usually in consequence of severe inflammations resulting from burns of the eye, and such are generally caused by the use of too powerful caustics employed in the treatment of eye affections.

It is very hard to cure, because it is extremely difficult to break up the adhesions permanently; and even a most skilful operation is liable to fail.

AFFECTION OF THE HAW.

In the inner corner of the eye is a semilunar fold of the mucous membrane, which is called the *membrana nictitans* or the haw, and resembles somewhat the third eyelid of birds. Its purpose is to protect the eye and sweep dust and foreign bodies from the eyeball.

It is subject to inflammations, which may be induced by injuries, irritants, faulty management, and likely by constitutional diseases; and such trouble existing, the following symptoms are noted: Redness, swelling — which is sometimes of such extent as to affect the sight — profuse flow of tears, and more or less pain.

Generally only one eye is affected, and when both are involved the assumption is justified that the trouble is probably secondary to some disturbance within the system; and as a rule it is then found that the general health of the victim is poor.

Bathing with warm milk is the usual treatment of kennelmen, and this application is of the efficiency of tepid water, and no greater. If as soon as the swelling appears a solution of borax and camphor water, ten grains to an ounce, or one of the sulphate of zinc and water, three grains to two ounces, is freely used, the affection should yield readily. In event, however, it resists these applications, it will be necessary to snip the membrane with blunt scissors.

This can be easily done, though it were best to entrust the operation to a physician.

A few drops of 5 per cent solution of cocaine should first be dropped into the eye. Then the membrane should be pierced by a light suture needle and a thread drawn through, by means of which it should be lifted up as far as possible from the eye. Now with the scissors a goodly piece of the membrane through which the thread runs should be cut away.

To bathe occasionally with cold water will be all the after-treatment required.

LACHRYMAL DISEASES.

The tears are produced in glands situated at the upper part of the orbital cavity, which open by ducts upon the surface of the conjunctiva between the eyeball and upper lid. The office of the tears is to keep moist the parts over which they flow, and preserve the transparency by preventing their surfaces from drying up.

The movements of the lids spread the tears uniformly over the eyeball; they are then conducted off through the lachrymal canals, which finally discharge into the nasal passages.

The lachrymal glands may be the seat of disease, though only rarely; and the chief troubles of the so-called lachrymal or tear-apparatus are in the canal which carries off the tears.

This canal is obstructed in what is popularly termed "weeping eye," in which the eye is constantly wet with tears that run over the cheek instead of being conducted into the nostril by the natural way.

The canal or tear-passage in question being very narrow, a slight swelling of its lining membrane is sufficient to impede the passage of the tears; and this swelling is generally the result of a cold in the head, in which there is a like condition of the lining membrane of the nostrils and throat.

A valve-like opening within the nose at the end of the canal is closed by swelling, which causes backing up of mucus or tears. Usually, however, a previous thickening, by "head-colds," causes an extension of the catarrhal inflammation to the tear-passage and eye itself.

Special treatment is required for the eye when this inflammation occurs in consequence of a cold, though as the cause disappears it may speedily subside. In cases, however, where mucus collects in such quantities in the sac, which exists at the head of the tear-passage, as to enlarge it, then an abscess is liable to form; in which event lancing will be necessary.

Camphor water and borax, as recommended for conjunctivitis, can also be used in this affection, though a solution composed of two grains of zinc in one ounce of water may be better. A 2 per cent solution of cocaine dropped into the nose will shorten the rhinitis and remove the epiphora — watery eye.

DISLOCATION OF THE EYEBALL.

Dislocation of the eyeball without much injury to the same sometimes occurs in man; and if reduction is speedily and skilfully effected, in many instances recovery is complete and the sight wholly restored. This accident with as fortunate results occasionally occurs in dogs, but as a rule there are deep lacerations and the vision is destroyed.

It usually happens while fighting, especially among bulldogs, pugs or other dogs that do not possess any bony arch of the eye; and in most cases the injury is more than mere displacement, consequently the eyeball must be removed.

When it occurs, medical aid should be summoned; but if there must be a delay of more than a few minutes the owner or caretaker should make an effort to return the eye to its socket, employing the following method: First, let blood-warm water fall from the hand upon the eyeball, to remove dust or other impurities. Then apply a little pure sweet oil, if it is at hand, but if not attainable without delay, the work must be done without it. With an assistant drawing the

eyelids open as much as possible, firm, steady pressure should be made on the eyeball for about five minutes, unless it is sooner restored. This should be tried with clean fingers only.

If success does not attend these efforts within the time stated, until the physician arrives let the eye be covered with a soft handkerchief wrung out of warm water; and meanwhile the poor dog be kept as quiet as possible.

The doctor should try pressure at first, but that failing, he should snip with scissors the outer corner of the eye and enlarge the palpebral opening.

This in turn being unsuccessful, he should remove the eyeball.

The operation is not a difficult one, still it ought never to be attempted except by a skilful physician or veterinarian. Unfortunately the number of the latter who have been educated up to operations like this is comparatively small, and they are seldom to be found except in large cities. All educated practitioners of medicine are equal to the removal of an eyeball, and yet if a physician who makes a specialty of diseases of the eye is within reach it would be far better to entrust the operation to him.

CATARACT.

There seems to prevail among the most experienced dogmen a belief that cataract occurs but rarely, if ever, excepting in old dogs, and that there is but one form of the affection. As a matter of fact this grave trouble sometimes exists in puppies at birth. It may also be caused by injury, as a blow, while in some instances it occurs in consequence of inflammation. But of the various classes doubtless the cataract of advanced life is the most common.

The abnormal change which occurs can scarcely be understood without some anatomical knowledge of the eye, so it will be well to glance at its construction.

The eyeball has often been compared to a photographer's camera, and the comparison is apt and convenient. It is essentially a hollow box, and contains, with its refracting fluids, a lens by which images can be formed, and a screen upon which they can be received. While in front of the lens there is a diaphragm with a variable aperture to regulate the amount of light admitted. Beyond this the interior surfaces are darkened with black pigment, as is the case with the camera; and the eye has much the same power of adjustment.

The lens is an elastic, bi-convex body, which not only looks like an ordinary glass magnifying-lens, but is equally as transparent — that is, in its normal state, but in cataract it becomes opaque, and in corresponding degree, of course, loses its transparency. This opacity or cloudiness prevents the image upon the background from becoming sharp and clear, as is essential for distinct vision.

Cataract in young puppies is generally attributable to defective nutrition

while the eye is forming in early embryonic life—to want of proper building materials or imperfect use of the same, owing to some defect in the mother, in consequence of which the lens is imperfect. And in these cases, as a rule, the trouble is rarely detected early unless the examiner has had much experience, though attention is usually first drawn to the eyes by the ordinary evidences of impairment of sight, or total blindness. In advanced life, however, it scarcely long escapes detection, provided the abnormal changes are extensive, for a grayish white opacity is plainly to be seen back of the pupil.

Once cataract begins to form it is almost always progressive, and although in puppies it may in extremely rare instances disappear spontaneously, such happy result is never likely to occur when the trouble manifests itself after maturity.

Until of late it has been held that no internal or external medication could cause an opacity of the lens to disappear, and the only recognized remedy has been the surgeon's knife, but some three or four years ago a case of a man in this country was reported in which the lens cleared up under the use of the juice of the *Cineraria Maritima*. Since then several other cures have been recorded, one of which occurred in a physician who tried the remedy after failure to improve under the care of eminent specialists. And he was led to do this by a knowledge of the practice of the natives of India, who have for years been accustomed to rely upon this agent in cataract (*nasala*).

The results, so well authenticated, excited no little interest among physicians generally, and many have since been anxious to give it a fair trial. But how to obtain the fresh juice, which has been proved to possess curative power, was for a long time a disturbing question, and until some one discovered among pot plants here in this country a variety of the *Cineraria Maritima* which is popularly called the *cartwheel*. And the juice of this is now being tried, but the results have not yet been recorded. Enterprising wholesale druggists have also obtained a supply of the juice from the countries in which the plant is indigenous, and it is now on sale.

If the juice in question has the effect on man which is attributed to it, it should certainly have the same on dogs. And those who have cases of cataract in their kennels will do well to try this simple and perfectly innocuous agent.

If the plant *cartwheel* is not obtainable the imported juice should be tried. Two drops of this should be dropped on the pupil three times daily; and the treatment be persisted in for several months.

Surgical interference in congenital cataract is a simple and easy process when it consists of needling or rupturing the anterior capsule through the pupil, but is necessarily attempted only by experts. It is to be recommended in place of tedious treatment, because the early months of a dog's life are most important for his training.

BLINDNESS.

In advanced age the sight often becomes much impaired. But rarely, however, is it wholly lost in consequence of years; for, as a rule, in blindness of long duration some structural change has occurred within the organ to account for it, such as opacity of the cornea, failure or paralysis of the optic nerve, cataract, or destruction of part of the refracting apparatus by disease. Animal parasites may also invade the eyeball and destroy the sight, they or their germs having been first acquired by eating infected raw meat.

In certain diseases, notably of the brain, blindness may occur. There are cases in which the causation is very obscure; but it is reasonable to attribute them in some instances to reflex irritation from worms in the intestinal canal, while in others intense derangement of some important organ, as the liver or kidneys, may rightly be held responsible.

An injury to the eye is always a serious and important matter, and should claim immediate attention; for if the damage is not irreparable at the instant of the accident, destructive changes may be set up which are apt to go on until the sight is nearly or entirely destroyed.

The most serious injuries as a rule are those received in fighting; and while some may be entirely recovered from, in the majority of the cases of wounds thus received the eye is practically ruined. Nor is this painful result always limited to the injured eye. Indeed its fellow eye is often in time as seriously affected by sympathetic disease excited therein.

Judicious treatment, however, will often accomplish great good, and possibly save the entire sight. It is evident, therefore, that in all injuries the best medical advice available should be obtained, and, if possible, always that of physicians who make the eye a specialty.

Excepting those cases in which it is caused by intestinal worms, the chances of recovery from blindness are never good, although the cause and duration are in some degree influential in forming a favorable prognosis. In blindness of recent and quite sudden occurrence due to injury or acute inflammation, partial or complete recovery occurs in some cases. On the other hand, in cases of several months duration in which the loss of sight was gradual, entire recovery is exceedingly rare, for then structural changes beyond repair have almost always taken place.

Where the indirect cause is intestinal worms the loss of vision is only moderate, unless it is of long standing, although it may appear to be quite complete; for it is exaggerated by the affection of the nervous system with which it is associated. This latter affection is commonly a paralysis of considerable degree, especially of the hind parts.

If the worms are speedily removed, the blindness is generally recovered from.

SECTION VII.

DISEASES OF THE EARS.

CHAPTER I.

GENERAL CONSIDERATIONS.

It is not surprising that the term "canker" is still employed for almost every affection of the ear, since traditional names applied to diseases by the laity continue to be used even after they have long been proved indefinite, vague, and inappropriate.

If a dog shakes his head and scratches the side of it occasionally for a day or two he is said to have this disease, whether his ears are affected superficially, from a slight irritation of the skin, or internally, from severe inflammation. When the hearing apparatus was a thing of mystery this was perhaps pardonable; but at the present time it is certainly not so, and the term canker should be obsolete.

In order to avoid confusion and make clear the purpose of the writer, the discussion of the anatomy and physiology of the ear will be omitted, and only a brief description of the essential parts of the hearing apparatus considered. These, divided broadly, are respectively the external, middle and internal ears.

The external ear comprises not only that outer portion which can be grasped with the hand, which is the auricle, but also the canal or passage leading inward. This passage ends at the drum membrane, which constitutes the dividing line between the external and middle ears.

The middle ear is situated at the bottom of the auditory canal, and includes the drum membrane and the little bones or ossicles which are to be found in the drum cavity or tympanum.

In conformity with the rule distinguishing inflammatory affections by the suffix *itis*, general inflammation of the ear becomes otitis; and to this can be added terms to designate the particular localities and structures affected. Thus, inflammation of the external ear may rightly be otitis externa, that of the middle ear, otitis media, and of the internal ear, otitis interna. But the internal ear rarely alone suffers from inflammation, and as a rule, if not invariably, where it exists it is but an extension of like trouble in the middle ear; therefore it is

quite sufficient for the purpose of this work to make but two divisions, and term inflammation of the external ear, *otitis externa* or external otitis, and inflammation beyond the drum membrane, *otitis interna* or internal otitis; the latter comprising all affections of this nature which occur in the middle and internal ear.

OTITIS EXTERNA.

Inflammation of the external ear is a common and often very obstinate affection, from which no part of the canine race is exempt, although some breeds are more frequent victims than others, owing to the peculiar formation of the outer ears, which favors an increase in intensity of every trifling irritation therein. For instance, dogs with small, upright ears are less liable to suffer seriously from such trouble than others with long and heavily coated flaps, for the reason that the passage to the ears of the latter is not as well ventilated; moreover, when affected the long eared shake their heads more violently and often, and this aggravates the existing irritation, which even if trifling at first is thus prone to become severe.

There are various degrees of severity of this affection. Thus in some cases there is scarcely any appreciable inflammation; in some also it is of such mildness there is simply slight redness; while in others the inflammation is almost as severe as in erysipelas, and attended by deep redness and much swelling. Again, the inflammation may be limited to a small area, but generally it extends over the entire inner surface of the ear-flap and into the passage of the ear. This is the rule where the trouble has existed several days and there has been much scratching at the ear or shaking of the head. External otitis also varies much in character, for it may be a true eczema, or a mere congestion due to increase of blood in the parts, or an inflammation attended with an eruption of blisters, pimples or pustules, and even small abscesses.

Various causes for otitis externa have been assigned, and include sudden chilling of the heated body, digestive disorders, improper food, over-eating, insufficient exercise, accumulation of the natural secretion,—the cerumen or wax—the presence of animal parasites and insects, a tendency to eczema, etc.

The cause may be from without, as scratching, dirt, sand, or other irritating particles in the passage, direct injuries to the outer parts, as from a blow, or it may be simply an expression of some internal disorder, and of like nature to that which gives rise to eczema.

During prolonged and severe attacks of distemper an eruption frequently appears on the skin, and in some instances the ears are invaded by it and otitis results. Indeed, there appears to be in all constitutional diseases of acute form

in which eruptions occur on the skin, a special liability to inflammation of some portion of the ear.

To include the vegetable parasite among the causes of otitis externa is strictly proper, because it sometimes gives rise to true inflammation.

This parasite is a fungus growth or mould, something like that which accumulates on stones in damp cellars. It forms quite deeply within the passage, usually on the drum membrane and adjacent walls, lessens the hearing power, and excites in some cases itching and twinges of pain sufficiently intense to cause constant shaking of the head.

The parasitic fungus in the ear passage is dependent upon the lodgment therein of its spores, which are doubtless conveyed in the air; yet it is evident that these spores would not germinate and increase rapidly unless they found favorable conditions. Precisely what constitutes such conditions is not known, and they may thrive where no abnormality about the passage can be detected, but it is safe to assume that dogs kept in damp and mouldy kennels or localities are the most favorably situated for harboring the fungus growths.

In cases of sarcoptic mange, otitis externa is a frequent complication, and it is easy to believe that the ear trouble is induced by the same parasite which causes the affection of the skin. This insect appears in considerable numbers on the outer ear, and can be seen making its way in and out of the ear passage onto the skin.

The detection of a tiny animal parasite in the ear has led to the conclusion on the part of some that otitis externa is sometimes contagious, and that the parasite is distinct from that which causes mange. No satisfactory evidence has been produced that otitis, *per se*, is contagious. As found occurring with mange, when that disease has been transmitted of course the accompanying ear trouble may be set up. An inflammation of the ear also occasionally occurs in scarlet fever and measles, but although these diseases, like mange, are contagious, there is nothing to show that ear complication is necessarily likewise communicable. Furthermore, it has not been satisfactorily demonstrated that this parasite found in the ears of dogs decidedly differs from that which causes mange.

Unless the ears are frequently examined, the first noticeable symptoms of otitis externa are likely to be shaking of the head, scratching at the ear, and restlessness.

On examination the outer ear is usually simply reddened if the trouble is of recent origin, but it may be hot and swollen, even in such cases; and the longer otitis exists, as a rule, the more severe the inflammation.

The notable exceptions to this rule are the cases caused by the presence of fungus growths, which may exist in an ear for a long time without giving rise to any appreciable inflammation. Such cases are not common, however, and in most instances of these growths a careful examination of the deeper parts of the ear passage reveals considerable redness and swelling; generally, also, the

walls of that passage appear as though fine coal-dust had been sprinkled over them.

If simple treatment is promptly applied, in many instances a speedy cure of the commoner forms of otitis externa can be effected; but if delayed the affection is likely to prove obstinate, deep and important structures becoming involved. Once the passage is thoroughly inflamed, recovery will generally be slow, and there is liability of ulceration occurring in its cutaneous lining and cartilages.

After the disease of the external ear becomes established in the passage, as far as can be seen it will appear to have a brownish coating. This collection is at first pasty, but in time may thicken, and if there is much inflammation it dries and forms crusts. If ulceration occurs, there is quite a copious discharge, which is at first a muddy brown, and after a time yellowish.

With the occurrence of the brownish coating there is an unnatural odor, which generally becomes highly offensive; and this constitutes a positive sign that the passage is quite seriously ulcerated, or the drum membrane is ruptured and the parts beyond are diseased.

A thick, yellowish discharge, — of what is commonly called matter — appears only in a very small proportion of cases, and in these there is either abscess, ulceration, or disease of the bones or cartilages; or the drum membrane has been ruptured and the discharge is from the middle ear.

The intensity of the symptoms, — shaking the head, scratching at the ear, and other signs of distress — are seldom in proportion to the existing disease. For instance, a dog may present them in violent form and yet have merely a mild and trifling irritation of the ear-flap; whereas another may suffer from serious inflammation or ulceration deep within the passage, the same having existed for a long time, and these symptoms be far less pronounced. However, in the latter the shaking of the head is generally more constant and occurs every few moments, and the head is often turned to the affected side.

This disease is usually unilateral, that is, in one ear only, although both ears are, of course, sometimes affected; but this is never likely except in cases of very long standing.

An accumulation of the natural secretion of the ear, if excessive, causes feelings of discomfort, with consequent shaking of the head, but there are no signs of inflammation to be detected, nor does any exist from this cause alone. Consequently such trouble cannot rightly be included under this head, but for convenience this mention is made.

When the passage and drum membrane are not involved in the inflammation the hearing-power is not affected except where the ear passage is blocked by "wax" or some foreign body, or the drum membrane covered in a similar way by a vegetable parasite; and an ear passage may even be inflamed without deafness resulting if not closed by the accompanying swelling. But in cases in which the inflammation is deep within the canal or there is ulceration, or the

ear has long been affected, the drum membrane is usually congested, and in time is apt to become thickened ; from which condition there is decided loss in hearing-power.

Where the inflammation is almost entirely confined to the ear-flap and the passage does not appear much affected, the trouble is generally eczema, and as a rule it yields very readily to the oxide of zinc ointment, or an ointment composed of the oleate of zinc, one drachm, vaselin, half an ounce. In a few cases the frequent application of the sulphur and lard ointment is sufficient, provided there is but little swelling and the victim does not seem to suffer very great discomfort. Yet even in mild cases the shaking of the head and scratching at the ear are so constant that rarely is it advisable to trust to so simple a remedy.

To control the shaking of the head and flapping of the ears by means of a cap or bandage is desirable if possible. But the same should be of light material and open texture, for anything of the sort that is closely woven, warm or heavy must shut out the air from the affected parts, and thus, by intensifying the heat and inflammation therein, add much to the sufferer's discomfort. Again, not very often can an ordinary appliance of the kind be kept in place without quite constant vigilance on the part of the caretaker. If, however, a dog persists in constantly shaking his head and frequently pawing at his ears, there is no alternative, and a covering must be used.

A knitted cap or bandage is the best ; but in the absence of such, preference is to be given to one made of muslin or thin cotton. The form usually chosen is generally too wide and comes too far forward. It should be broader in the middle than at the ends, to each of which should be attached three pieces of tape. The cap adjusted so that its anterior edge comes a little back of the eyes, one tape should be tied in front of it, one over its middle, and the other around the neck. It will not be easily removable then, but if the dog succeeds in pulling it off over his eyes, more tapes must be sewed to its posterior edge, and by the means of these the cap be fastened to the collar.

Endeavoring to dispense with a cap or bandage and rely on some medicinal application to control the itching and consequent flapping of the ears, cocaine is the remedy to be tried ; and it should be incorporated with the oxide of zinc ointment, the proportion being not less than 3 per cent of the former.

This ointment should be applied to the reddened parts as often as necessary to keep them coated with the same ; and if there is notable improvement it should be persisted in until recovery has occurred.

Should the case be obstinate and the gain very slow, a mixture of carbolic acid and glycerin should be obtained, there being one-half a drachm of the former to one-half an ounce of the latter.

While treating the affected parts with this mixture, once a day for two or three days, the ointment containing cocaine is to be used, being first applied fifteen minutes after the painting, and frequently during the day.

If this treatment is not speedily successful, an ointment consisting of the ointment of ammoniated mercury and vaselin, in equal parts, should be substituted, and used two or three times daily.

Where the redness and swelling extend over all or the most of the ear-flap, and the ear passage is also more or less swollen, the inflammation within generally subsides as improvement occurs in the outermost parts.

Even when the ear-flap is much inflamed sometimes the passage is not seriously affected. It is a fact also that in the most severe cases of inflammation deep within the passage the ear-flap may not share in that inflammation; and if it does become reddened and inflamed this condition is generally attributable to the shaking of the head and flapping of the ears.

When a dog exhibits these symptoms, — shaking the head and flapping the ears — and the ear-flap is not much reddened or inflamed, it may safely be assumed that there is trouble deep within the ear passage or beyond the drum membrane.

If the passage does not appear inflamed and swollen it may be that there is a fungus growth, or dirt, gravel or other foreign body that is causing this discomfort, and a syringe should be called into service.

Were skilled hands to use it the form of the syringe would not be very important, — that is, it might be large or small, of glass or rubber, etc. — but for common use the safest and best is the so-called "Fountain Syringe." But even this will require some modification, because the smallest end-piece or nozzle, being of hard rubber, cannot be used to advantage.

In all drug shops there is on sale very small rubber tubing which is commonly used on nursing bottles. A piece of that, or the smallest tubing obtainable, three or four inches in length, should be drawn onto the smallest nozzle. The free end of this can then be inserted into the ear passage, and being flexible and soft, will adjust itself to the passage, enter deeply, and do no harm.

The capacity of an ordinary fountain syringe is about two quarts, and it should be filled with clean, warm water, the temperature of which must be right, because it would do harm were it too high or too low.

One's cheek near the nose is very sensitive, and after the syringe has been filled with water that feels comparatively warm to the hand, and the water allowed to flow away until all within the long tube has been changed, the stream should be directed against the face, and the temperature adjusted if not right.

This done, the reservoir or bag of the syringe should be hung on a nail five or six feet from the floor, and the small, soft rubber tube, that has been drawn over the end of the smallest nozzle, should be gently inserted as deeply as possible into the ear passage, and the water allowed to run in.

When the flow has stopped, remove all the water that remains in the ear passage by having the head of the dog so twisted that the affected ear is on the under side, and then the outside of that ear gently kneaded or rubbed with the

finger tips, to encourage emptying. This should occur in the course of a minute under skilful manipulation.

If these directions are carefully followed, syringing can do no harm, but any departure from them might be hazardous; and even at best in unskilled hands it is seldom wholly satisfactory unless used for the removal of some foreign body which has got into the ear. Therefore, use a syringe no more than seems absolutely necessary.

If the ear passage appears inflamed and the shaking of the head and the flapping of the ears are of recent occurrence, it may be accepted that the trouble is acute, provided no very bad odor can be detected.

In such cases, after using a syringe, and thus making sure that the passage is free and clean, it will be well to pour into it, from a teaspoon, a few drops of a solution of borax, ten grains, in camphor water, one ounce; and repeat the application every five or six hours if improvement is noted.

If the case is a mild one and the foregoing does not speedily act well, a solution of the acetate of lead, eight grains, and water, four ounces, should be substituted; and a small quantity be dropped into the ear three or four times daily.

These solutions are unlikely to have much effect except in mild cases, and in others severe, one composed as follows should be used: Goulard's extract of lead, laudanum, and the fluid extract of hamamelis, of each two drachms; water, one-half ounce. The ear should be filled with it twice daily.

If this in turn fails to effect a cure in the course of two weeks, it should be discontinued for a week, and during that time a 3 per cent solution of carbolic acid and glycerin should be used instead; a few drops of it, warmed, being dropped into the ear, two or three times daily.

Simple inflammation of the ear passage usually disappears promptly under the foregoing methods of treatment, but if in any case recovery is not effected it will be safe to assume that the trouble is more serious than a simple acute inflammation.

The most discouraging sign is a highly offensive odor. Though this may be present when the disease is confined to the external ear, in which case it is usually due to ulceration in the walls of the passage, more often the drum membrane has been ruptured and the trouble is in the inner ear.

In cases in which the odor is manifested and does not disappear in the course of a week under proper treatment, the outlook is doubtful. They are sure to prove very obstinate and tedious, and only rarely will a cure be effected.

The first step in the way of treatment may properly be a thorough syringing, the instrument being used as already advised. After that a solution of the peroxide of hydrogen must be largely relied on.

In a coffee-cupful of water should be first dissolved one-half a teaspoonful of saleratus, to render it alkaline; then should be added one ounce—two tablespoonfuls—of the peroxide of hydrogen.

This solution, after being slightly warmed, should be poured into the ear every five hours. The passage should then be filled with iodoform gauze, first cut in very narrow strips.

As long as there is a notable gain it should be persisted in, but if improvement is not plain, a solution of double the strength should be tried. That is, instead of one ounce there should be added two ounces of the hydrogen peroxide to a cupful of water.

Some writers have recommended the introduction of iodoform powder or iodol in this class of cases. They would doubtless act fairly well if properly applied, but when simply dropped into the passage, as many would use them, the effect would scarcely be more than to convert one bad odor into another equally, if not more offensive. Again, if the passage is much swollen and there is considerable discharge, the use of powders is not advisable, for they coat the sides of the canal and choke it up. However, if a solution of the peroxide of hydrogen does not effect a cure, boracic acid powder may be tried as follows :

Obtain an ordinary small blower such as is commonly used with insect powder. Draw over the tin tube two or three inches of the smallest soft rubber tubing that can be obtained. Introduce two or three teaspoonfuls of the powder into the blower, gently insert the end of the rubber tubing into the passage as far as possible, and then start the blower. By this means the powder will be forced to the parts most affected, and which it could not reach were it merely dropped in.

Another very simple method of introducing the boracic acid is by means of a piece of small rubber tubing, about one foot in length, in one end of which has been inserted, for a short distance, a goose quill. The powder is taken up in the quill, which is then carefully carried into the ear passage as far as possible; and when in place, the operator gives a short, quick blow through the tube, to free the powder from the quill. Then he blows steadily for a fraction of a minute, for the purpose of forcing the powder as far as possible into the ear passage.

This method is Sewell's, and he repeats the operation from three to six times at one sitting, as it is necessary to nearly fill the ear passage, taking up evidently only a comparatively small quantity of the powder at each dip of the quill.

He has very great confidence in boracic acid in cases in which the discharge is copious, offensive, and purulent; applies it morning and night for a week, or until the discharge has materially lessened, and thereafter once daily until a cure has been effected; and urges that by this treatment he has permanently cured cases of the very worst form that have existed for years. Time, patience, and care, however, are required, and in many cases the treatment must be persisted in for several weeks. Every day also before applying it the ear must be cleaned by syringing, and methylated spirit used in the operation, in the proportion of

two tablespoonfuls to each half a pint of water; one-half of which quantity will be quite sufficient for one ear.

Manifestly if the general health seems to be impaired, tonics and a generous diet are indicated.

If a case resists treatment for several months without improvement it may be accepted that some structural change has occurred in the ear which makes a cure quite doubtful. Then, if the dog is not of much value, it will be advisable to sacrifice him, although he might live for several years and otherwise seem fairly well.

OTITIS INTERNA.

As stated in the opening section, the drum membrane divides the external from the middle ear; and although inflammation of the latter should properly be termed otitis media, and inflammation of the deeper parts otitis interna, it is quite sufficient for all purposes to combine inflammations of the middle and internal ear under one head — otitis interna.

Inflammations sometime originate in the cells, canals and structures that constitute the inner ear; but, as a rule, to which exceptions are comparatively rare, they first occur in the middle ear and extend inward. They also extend outwardly, in the opposite direction, and involve the drum membrane and external ear. Such inflammations may be confined to the mucous membrane that lines the middle ear, to the membrane covering the small bones, or even the bones themselves, though all these may become affected by them.

The usual causes of otitis interna are exposure to cold, shock, such as may result from plunging into icy water, from remaining too long in cold water, and from injuries and blows in the region of the ears. It may follow and be a part of an inflammation that started in the external ear, otitis externa, and broke through the drum membrane; but this accident is far from common. Certain constitutional conditions and disturbances, which do not directly cause this affection, at least favor its occurrence. For instance, a dog whose blood is poor and his system debilitated, falls a victim to otitis interna much sooner than one in good health.

In some cases of inflammation of the ear it is not possible for non-professionals to determine whether the same is external or internal otitis, though the existing disease has been on for weeks or months; but, as a rule, in acute cases, in which the inflammation commenced within a short time, it is easy to discriminate between the two forms, because the symptoms of internal otitis are much more severe than those of the external.

Otitis interna generally commences quite suddenly, usually attacking one ear, and is characterized by pain that is sometimes so severe that it is almost mad-

dening, causes the poor victim to shake his head violently, rub his ear on the ground, utter sharp, shrill cries, and often run about and otherwise act as though delirious. When the affected ear is examined he shrinks under the touch, and likely endeavors to break away, so great is the tenderness.

The passage to the ear may not at first seem affected, but generally it soon becomes more or less reddened, quite swollen, and hot and dry to the hand.

There are also signs of disturbance of the general system, as a hot nose, fever, rapid pulse, thirst, and entire loss of appetite.

The painful symptoms usually persist four or five days, although in occasional cases death soon occurs from meningitis, caused by extension of the inflammation in the ear to the brain. Sometimes the victim dies during an attack of convulsions.

If the sufferer lives, fluid exudes within the middle ear, and in the course of four or five days bursts through the drum membrane, and makes its way out through the external ear passage.

This discharge, yellowish and streaked with blood, becomes purulent; and although odorless at first, in three or four days it is highly offensive.

After an opening has been made in the drum membrane and a discharge occurred, the pain speedily subsides, together with the signs of general disturbance. In most cases that discharge keeps up for two or three weeks and then disappears, and the opening in the drum membrane closes and heals; but this happy result is rare indeed. As a rule the injury is permanent, the hole in the membrane remains, the small bones of the ear are attacked and destroyed, and other delicate structures become diseased beyond repair; and, although the victim may live for years and keep in apparently good condition, very generally the habit of shaking his head continues to his death; there also persists a highly offensive odor about the ear, notwithstanding there may be little or no external discharge.

Much less often the disease of the structures of the internal ear gives rise to an abscess at the back of the ear. In these cases the usual signs of an abscess appear upon the surface, as swelling, tenderness and fluctuation on pressure.

During an attack of otitis interna, in consequence of the severity of the symptoms, the general system suffers severely, the victim is soon weakened, and there is notable loss in weight or decided emaciation.

The results of internal treatment are never highly satisfactory in this disease, because relief of the pain is the first requirement, and that is difficult, owing to the peculiar resistance of dogs to the action of opiates.

Cocaine in a five per cent solution should be tried, ten drops being dropped into the affected ear, and the head held firmly for a few minutes, to prevent it being thrown out, or the finger used to plug the ear. Or, better still, by means of a glass dropper, which can be obtained from any druggist, take up about one-fourth of a teaspoonful of the cocaine solution, gently enter the tip of the

dropper into first one nostril and then the other, and force the medicine in as deeply as possible.

Better results follow the use of the medicine in the nose than in the ear.

If this has a good effect it should be resorted to every two or three hours, as required. If, however, it does not seem to lessen the pain, a teaspoonful of warm water and laudanum, in equal parts, should be used in the ear, in precisely the same way.

Soft cloths should also be wrung from hot water or hot alcohol and kept on the affected side of the head if possible. Or a warm poultice of boiled onions will have even greater soothing effect.

If, notwithstanding the use of cocaine or laudanum and the hot applications, the pain continues intolerable, morphine should be given in doses of from one-quarter to one-half a grain each, and repeated every hour, until some relief is noted.

During the painful period, of four or five days, efforts at feeding will scarcely be successful, yet they should be persisted in, the debilitating character of the attack being kept in mind. After that stage has passed the diet must be generous and highly nourishing, and the appetite stimulated, if necessary, by quinine, given three times daily, the dose being one or two grains.

When the discharge appears the ear should be well syringed every day.

If this treatment is insufficient to remove any offensive odor from the ear, the peroxide of hydrogen should be used as advised in otitis externa.

In cases in which the discharge soon ceases and the opening in the drum membrane closes and heals quickly, there is usually but slight, if any, noticeable impairment of the hearing power, but where the opening is permanent the hearing is generally, though not always, much affected. When the discharge persists, however, and the deeper and delicate structures become diseased and are destroyed, very decided, or total, deafness results.

A case that has resisted a cure for several months will generally prove hopeless.

OTITIS PARASITICA.

Several writers on canine diseases treat of a parasite to which they attribute an aggravated form of otitis. From their description it would seem to bear a very striking resemblance to the sarcoptic canis.

One observer found this parasite in an ulcer of the ear, which was accompanied by a deep-seated otitis. Sewell states that where it was present he found the ears looking slightly dirty, that appearance being caused by a little dried, brown excretion or cerumen; that if the inside of the ear is closely examined and carefully watched, tiny white specks, oval in shape, and about the size of the

eye of an ordinary sewing-needle, will be observed. These he believed to be parasites, and the cause of some cases of canker. "They may be seen running about the skin, and also along the hairs in the ear at a fairly rapid rate considering their minute size." Again he says: "I have never been able to find the acari anywhere else about the dog but in the ear; in truth, they do not seem to wander outside the canal and crevices formed by the cartilage, not even upon the flap of the ear, either inside or out. They vary in numbers — sometimes one can only find a few, about twenty; in other cases they are present in hundreds, lying in clusters, like heaps of fine white powder. I have also frequently found these same parasites in cats' ears, and in some cases they induce rather extraordinary symptoms, the cat being almost unable to walk. In fact, when it attempts to do so, the animal rolls about as if intoxicated, frequently falling over on its side. I have never seen the acarus produce the same symptoms in the dog."

Where this parasite is present and troublesome, the appearance of the ear differs but slightly, if any, from ordinary otitis. There seems, however, to be less discharge. The head is carried to one side, and from time to time the dog whines, and scratches the affected ear gently with his paw. One author describes, as an effect, epileptiform fits, in which the victim emits a peculiar, husky cry, and rushing wildly about, running into various obstacles, finally falls insensible; and after a number of such attacks becomes totally deaf.

The parasite is said to be readily destroyed by mercurial ointment, which should be diluted as follows: Ointment of the nitrate of mercury, one-half a drachm; simple ointment, four drachms. A little of this should be applied, morning and night, to the inner surface of the ear, and carried into the passage as deeply as possible, by means of a bit of cotton on the end of a wooden toothpick.

MAGGOTS IN THE EAR.

Several cases are on record in which maggots were found in the ears of dogs.

The insect from which they came was probably the blow-fly, and after invading the ear it doubtless remained long enough therein to "blow"; and in one instance the number of maggots hatched out were over one hundred.

Pain appeared to be the most pronounced symptom produced, and the conduct of the victims while under the infliction closely resembled that of dogs suffering from severe attacks of otitis.

Turpentine was used in one instance and sweet oil in another, and both with good effect, the maggots speedily crawling from the ear passages.

Doubtless no better remedy can be recommended than the oil of turpentine, which has for a long time had the reputation of being a strong antagonist to larval life.

POLYPUS.

This is a growth of a fleshy substance, similar in appearance to some warts, and is the result of a natural effort to heal up a broken drum membrane or some spot of denuded or ulcerated tissue, either in the external canal or drum cavity. Most frequently it is an accompaniment of one or another of the diseases of the external or internal ear, in which a granulating mass of proud flesh, so-called, has existed for a long time.

Of polypi there are two forms to be considered, although one is rare. The latter is nearly colorless, of the appearance of flesh, and is attached by a stalk at about the middle of the passage to the ear. Its surface is smooth; it is not sensitive under touch, and frequently exists without causing any discharge.

Cases of the other form, although it is more common, are not often encountered. It bleeds easily, and for that reason is sometimes called bleeding polypus. It varies in size, and may be sufficiently large to appear at and fill the outer opening of the ear. In color it is deep red, and its surface rough and glistening. It is almost like gelatin in substance. Unlike the other polypus, it is exceedingly sensitive, and bleeds easily; it also forms more deeply within the passage, and nearer the drum membrane.

As polypi are favored by, if not the product of, inflammation of the ear and discharges therefrom, they are most common in old cases of otitis, externa or interna; and therefore they may be suspected to be present when such cases do not improve under treatment, and when yellowish, bloody, and highly offensive discharges persist. Only when seen, however, can their existence be determined, for none of the symptoms occasioned by them are positive.

Powdered alum or boracic acid blown into the ear might cause a polypus to shrivel and waste, but a physician should be employed to remove it by means of proper instruments.

DEAFNESS.

Impairment or loss of hearing power is generally the consequence of otitis, during which the drum membrane was ruptured or seriously involved by the inflammation; and it may be caused by direct injuries, such as blows on the head, and by accumulations in the passage to the ear. It is an occasional accompaniment of age, although old dogs as a rule retain their hearing to a surprising degree. After disease of the brain the hearing may be affected, but death is generally speedy in such cases. Deafness is also sometimes caused by quinine; but this effect is usually transitory. It may be transmitted by inheritance; and in some breeds, notably bull-terriers, instances of this fact are quite

common. Excepting where the deafness is due to accumulations which can be removed, the results of treatment so often prove negative that it is therefore not encouraged.

ABSCESS OF THE AURICLE

Occasionally blisters form on the ear-flap, and commonly in consequence of blows or tugging at the ear. The violent and constant shaking of the head induced by otitis may also excite them if the victims have long and heavy flaps.

They have the baggy appearance peculiar to all blisters, and contain a thin, watery fluid at first. If, however, proper treatment is not promptly applied, their contents thicken, to become yellowish; and then the blisters are converted into abscesses.

An opening of fair length should be made at the lowest part of the blister, and its walls pressed together, to cause them to unite readily. If they fail to do this, and ulceration occurs, to be followed by a running sore, it should be treated with the oxide of zinc ointment.

BLOOD TUMOR OF THE AURICLE

Othæmatoma or blood tumor occasionally appears in dogs, and is commonly the result of blows or violent flapping of the ear. It is sometimes of small size, but now and then cases are met with in which the tumor covers nearly or quite the entire inner surface of the auricle.

The proper treatment is to pass a needle, threaded with white silk, in and out of the tumor at its lowest part, and tie the latter so it cannot slip out. By these means there will be two small openings which cannot close, and the contents of the tumor will be evacuated and keep drained off.

A piece of sheet lead should be cut as nearly as possible to the shape of the tumor. This, used as a compress to keep the walls of the empty sack together, assists it to unite. With holes at its various corners, it may be carefully adjusted over the tumor and then stitched to the ear, the needle being driven through the holes and ear-flap and back again, and the silk tied — but not too tightly.

WOUNDS OF THE AURICLE.

A tear of the flap of the ear, even if it is only a small one, often proves to be intensely troublesome. The flap as a whole is highly vascular, or in other words,

it contains many blood vessels. The most of these are small ; but it is far more difficult to control bleeding from them than where the same occurs from large vessels. Besides this, even a very small wound of the flap is annoying to a dog, and causes him to shake his head at frequent intervals, in consequence of which healing is prevented.

It is always best to stitch at once a tear in the ear if a notch is formed by it. After the operation, the dog should, by means of a hood, be prevented from flapping his ears. This is much easier said than done ; still every effort to secure rest for the affected parts should be made ; otherwise the stitches are sure to tear out if the wound is over half an inch in length ; and if they do, the owner is in for a good deal of trouble ; healing will be resisted, and the frequent oozing of blood in consequence of flapping the ears will prove exceedingly unpleasant.

SECTION VIII.

DISEASES OF THE NERVOUS SYSTEM.

CHAPTER I.

RABIES.

ESTIMATING fairly the real importance of rabies, all the subject deserves would scarcely occupy a single page; but unfortunately the average reader would not be satisfied with a distinction in this instance, and what must seem an indifferent and incomplete discussion, especially of the symptoms, which are many and varied, also difficult to describe understandingly if any attempt to abbreviate is made. It will therefore be treated exhaustively, in keeping with the rule observed throughout this work.

Many able physicians have stoutly insisted that hydrophobia, which is supposed to be contracted from rabies in the dog, is purely a disease of imagination, and the result of fear and education, for which the newspapers and their hair-raising descriptions of the sufferings of supposititious victims of that so-called disease are accountable. In other words, these physicians insist, and endeavor to fortify their assertion with statistics, that hydrophobia never occurs in the human family, and that all alleged cases of it are utterly incredible and wholly spurious.

Be they right or wrong, the fact stands out, in such bold relief it cannot be mistaken, that if members of our family ever do suffer from hydrophobia, it is one of the rarest of all diseases. Another fact of equal prominence is, that rabies is one of the rarest diseases of the canine race.

For a long time a most obstinate unbeliever, the writer now holds that there is such a specific malady as rabies, and that dogs are sometimes victims of it; but that it is so extremely rare, the most extensive breeder and zealous investigator is never likely to see a case of it.

As to the fear of hydrophobia, it cannot with justice be said that the people among whom it is prevalent are the most superstitious, credulous and imaginative, and that, being utterly groundless, it is scarcely possible to disassociate the delusion from mental feebleness and over-excitability; for while deploring such needless agitation over the subject of hydrophobia, that it has attracted so much

attention to itself cannot occasion any surprise, considering the tragic features of the final struggle, the long uncertainty as to the outbreak, and the invariable failure of medicine to effect a cure. Moreover, the impartial investigator must believe it to be a real danger, slight though it may be.

Of the reputed cases of hydrophobia in man, it may be said that nearly all, if not all, are the products of imagination, which simulates the characteristics ascribed by popular superstition to the disease called rabies; and the deaths in the most of such are attributable to lock-law, or to fear, epilepsy, acute mania, or hysteria and nervous collapse.

Indeed, the picture of hydrophobia is so stamped upon the minds of all, that the mere thought of it, after being bitten by a dog, throws imaginative people into such panics of nervous excitement that they unconsciously reproduce its supposed symptoms, and die without having experienced a touch of any real disease. And notwithstanding the efforts that have been made to dispel this delusion, and thus ease the public mind, a gain is scarcely perceptible; and he must be near right who has said that hydrophobia "can best be cured in the patient's grandfather,—that is, by educating the people now that there is no such disease, or at least that it is as rare as hen's teeth, and by so doing our grandchildren will not know of nor suffer from it."

It has been aptly said that the serious and oftentimes fatal influence of terror and expectant attention, fostered by popular alarm, is attested by other epidemics of imitative nervous disorder, and is a familiar fact to those who have carefully studied the influence of the mind on the body. From the fifteenth century, when Alsatian peasants imagined that they were changed to wolves, ran on all fours, howling and tearing children to pieces, insisting that their limbs be lopped off in order to convince others that the wolfish fur grew inward from their skins, down to the present day, when those dreading hydrophobia bark like dogs, mew like cats, and are thrown into convulsions at the sight of water, the records of hydrophobia are replete to overflowing with delusion, superstition, hysteria, and unconscious simulation.

Rare as hydrophobia certainly is in the human family, as already said in substance, there is sound reason for the belief that rabies is scarcely more common in the canine race. At all events it is safe to assert that not one dog out of a thousand supposed to be rabid or mad is really so. Indeed, in some countries where dogs are notoriously numerous not a single case of the disease has ever been heard of.

Dogs frequently have attacks which so closely resemble rabies that even an expert would find it difficult to distinguish between them. For example, in hot weather they sometimes suffer intensely from the heat, and are then extremely liable to become delirious, run wildly about, and finally go into convulsions. Such an attack occurring while a dog was away from home and on a public street, there would be every chance of his being killed as rabid; whereas were a

bucketful of cold water poured on his head, or even were he left undisturbed, in the course of an hour he would likely be playing about, showing no sign whatsoever of his ill turn.

Among the causes of coryza or nasal catarrh is a small *tænia*-like parasite. This excites a severe inflammation of the upper nasal cavities and sinuses of the forehead, which may extend to the brain and produce terrifying symptoms, as great excitement and restlessness, snapping and biting, also paralysis of the lower jaw, which are certainly identical with some of the most prominent signs of rabies.

Some breeds, as, for instance, sporting-dogs, have nervous systems that are adjusted with exceeding nicety. They are what would commonly be termed "high strung," and easily thrown off the balance. With this condition there is associated a natural tendency to certain disorders which are likely to be complicated with brain symptoms, as delirium and convulsions. Again, there are affections that give rise to symptoms so closely resembling those exhibited by a rabid dog that one could not distinguish the positive ailment with anything like certainty. As an illustration, the effects of the parasite giant strongle are cited. This occasionally finds its way into the kidneys, not only of men, but of dogs, and in the latter causes symptoms which are very like those of rabies. There is a disposition to bite, the sufferer avoids the light, his mouth is red, and from it there falls a thick, ropy, mucous discharge; while his voice is hoarse, gait vacillating, and expression changed, although indicating suffering rather than ferocity.

A dog presenting those symptoms is sure to be killed as rabid, notwithstanding he is suffering from inflammation of the kidneys induced by the parasite named.

The symptoms of dumb rabies are rather more distinctive than those of the maniacal form; and yet much the same may be induced by an irritant poison, which, taken into the mouth, causes the tongue to swell and protrude. A dog so unfortunate would for a time have mucus and saliva in abundance, and this discharge would be thick and ropy. His mouth would be very red and constantly open, and one could scarcely tell whether the inability to shut his jaws was due to paralysis—a characteristic symptom of dumb rabies—or to the swelling of the tongue.

In such condition a dog could not swallow, or only with exceeding difficulty, and thus would exhibit another peculiarity so prominent in dogs with dumb rabies; namely, he would plunge his muzzle into water up to the very eyes, in order to get a few drops into the back part of his mouth, to cool his burning throat.

Many other illustrations might be given of comparatively innocent derangements and diseases which are manifested by symptoms resembling those of rabies, as severe pain, especially in an ear or a tooth, excessive and terrorizing

fear, starvation, worms in the nasal cavity, disease of the kidneys, inflammation of the ear, brain trouble, and certain irritant poisons, which, when swallowed, cause intense inflammation of the throat, stomach, and bowels.

Some will be reluctant to believe it possible to mistake rabies for affections so radically different in many respects; but the fact should be borne in mind that fear prejudices reason, dulls perception, and blunts judgment, and that even the mere thought of hydrophobia is terrorizing. In consequence grave symptoms are overlooked, while many that are nowise significant are given an exaggerated importance.

Here the fact may well be emphasized that it is not possible, in a single instance, for the highest qualified expert to determine positively from his symptoms whether or not a dog is rabid, not even if the patient be kept and closely watched from the appearance of the first sign of trouble up to his last breath, his death being allowed to come naturally.

Of course, had a suspected dog bitten other dogs, and they eventually presented symptoms of rabies, it would not be reasonable to doubt but that he, himself, had that malady. But in the absence of such straight history, and, considering each case alone, positive proof of rabies can only be found under a microscope, or secured by the inoculation of a well animal from the one suspected of being rabid.

The cause of rabies is a virus or poison, which exists in various parts of the rabid animal, and especially his saliva, through which it is communicable in biting. Thus inoculation occurs, and but rarely, if ever, in any other way.

The wound from the bite of a rabid animal heals very readily, and is rarely attended by inflammation — that is, of greater severity than would commonly occur in a wound differently made.

The period of incubation or development of the disease is near one month in the majority of cases. It may, however, be two months, or possibly a little more. But the genuineness of reputed cases in which it is said to have been of much longer duration, — seven or eight months, for instance, — must be open to grave doubts. Shorter periods than one month have been quite frequently reported; and in one case it was said to be only one week; but cases in which it is so much shorter than the average should be classed as doubtful, with those in which the delay of the occurrence of the first symptom was so very unusually long.

Rabies assumes two forms, the violent, and the sullen or dumb. They have but little in common; and their symptoms are so manifold and so greatly influenced by such conditions as age, temperament, conditions of life, etc., an accurate description of them is not possible without wearisome detail.

Sometimes the first signs of trouble in rabid dogs are “gagging,” hawking, and pawing at the neck — precisely such symptoms as would be produced by a bone or something of the sort stuck in the throat. But very generally

the first indication of the grave malady is a peculiar change of demeanor characterized by evidences of unusual affection for the master or caretaker of the victim. This, however, would not likely be noticed except in the very small class made up of the habitual undemonstrative.

Of the very first symptoms, general restlessness is one of the most common. For a moment the unfortunate is dull or seems to sleep, then suddenly he starts up, on the alert and watchful, and as quickly subsides, but to remain quiet only for a few moments. He is inclined to creep under chairs or other furniture, hide around corners or in out-of-the-way places, choosing solitude, and shunning always a full light. He does not, however, at least at first, remain long in any one place, and is what is termed fidgety, now lying down, but soon up again, and jumping or running about in an excited manner; and likely he tries to get away if an attempt is made to restrain him. He is quite liable then to growl and snap at the hand holding him.

Herein is a symptom of very great importance; and the fact should be ever in mind that when the signs previously described, — restlessness, etc. — have been noted in a dog of kindly and affectionate nature, and he attempts to bite one for whom he has had a fondness, the act should be accepted as indicative of a disordered brain, and very suggestive of rabies.

While for a short time some dogs that are becoming rabid seem more affectionate towards master or mistress, the same unfortunate is quite sure to appear unusually suspicious of mere acquaintances and others, from whom he shrinks, and by whom he is easily enraged if they attempt to interfere with him.

For a time, even if he has not manifested any unusual affection, he likely comes when called by one who has known him intimately; but he generally does so reluctantly, his manner being crouching and frightened, and soon he returns to his hiding-place.

It is not long before the dog's power of recognizing people about him is lost. Then his eyes, which are slightly reddened, wear a vacant, far-away, listless look. It is now difficult to fix his attention for more than a moment, when generally his eyes will close in a sleepy manner, and remain shut for several seconds.

In the early stage of rabies the appetite is perverted. At first food may be eaten sparingly, but soon it is either rejected altogether or only taken into the mouth to be immediately dropped. It is now that the unfortunates seem fond of resting their noses against cold substances, and licking the same. They may even lick their own urine; and this is a very suspicious symptom. They also show a disposition to eat, and will swallow, if possible, all sorts of indigestible substances, as small stones, pieces of wood, coal, straw, dung, rags, and like things within reach, and which under ordinary conditions they would not touch. And in this peculiar tendency appears another sign suggestive of rabies.

In this stage the desire to constantly chew something seems irresistible, due

possibly to a peculiar feeling in the jaws excited by irritation of the nerves. If in the house, the poor dog bites, tears, and worries chair-legs, the corners of carpets, boots, or other loose objects—in fact, anything that he can fix his jaws upon.

Extreme thirst is now usually present, and water is drunk with avidity. The mouth is either perfectly dry, and the tongue parched, or the secretions therein are thick and ropy; and they occasionally excite efforts to vomit, which have often led observers to think there was a bone in the throat.

The first stage in which the foregoing symptoms are manifested is denominated the melancholic, and generally only of a few hours' duration; it may, however, although but rarely, extend over two or three days. The fact should be appreciated that not all the symptoms are uniformly present. Indeed, in some cases those manifested are few and insignificant, and might possibly be overlooked, or if detected, sufficient importance would not be attached to them. This period, therefore, is the greatest menace to man.

The next is the so-called irritative or maniacal stage, and this generally excites alarm, when it is perhaps too late.

The dog's eyes have now undergone great change. Alternately wide open with fury and then closed, they are red and inflamed; the pupils are dilated; the forehead has become wrinkled; and the look is sullen, ferocious, and terrifying.

A very strong desire to bite is exhibited. This can be excited by teasing; and even if a red-hot iron is used, it will generally be bitten. The presence of any living thing sends the poor dog into a rage, causing him to spring at and endeavor to rend the intruder; while mothers have been known to lacerate their puppies. Any shining object will also bring on like paroxysms of rage; and even water, if it reflects the light, will do the same. At first the excitement induced in this manner does not last long, and is followed by a period of great prostration, during which the unfortunate lies in the quietest spot he can find, insensible to all going on about him. This period is also short, and another fit of rage occurs on the slightest provocation; or even without any he all at once springs up, greatly excited, and seemingly wildly delirious, and in a perfect fury, which is always greatest when in the midst of noises and he can see living objects.

It is now that a characteristic symptom becomes very pronounced; namely, a peculiar change in the voice or bark. This is more of the nature of a howl, and is short, hollow, dismal, and croupy.

Early in this stage, when not confined, the sufferer exhibits a propensity to stray. If so, he often covers long distances in singularly short time, and if the malady has not far advanced, he may return slyly home. The violent stage well entered, however, his brain seems on fire. He runs on, evidently partially, if not wholly, blind; for he rushes at about everything that comes in his way,

sometimes springing on the same, but generally biting or snapping as he goes by, and rarely turning from the course he is pursuing to attack anything unless it be animals of kindred species, which almost invariably excite his rage and invite encounters.

He is evidently deaf as well as partially blind, for he seems oblivious of all shouts and yells, never varying for them from his direct course.

His gait is somewhat characteristic. It is a jog-trot, and unsteady. His head hangs low, and his protruding tongue, often torn and bleeding, is swollen and covered with dirt, while his tail is carried as usual until weakness causes it to droop.

It would seem that he still retained, to a slight extent, his ability to discriminate between the objects encountered, for he is somewhat less disposed to attack man than other living things. And notwithstanding his evident wild insanity, he appears to retain also a trace of the instinct that prompted him during his long run to divert his course toward his home.

If the unfortunate is confined, as the disease progresses he seems possessed as it were by spectral illusions; for now he springs at the door as though he heard some one approaching; again, he examines every part of his kennel or room in the most careful and minute manner, and then retires to an obscure corner, but to remain only for a few moments, when he recommences his wearisome search. At times his eyes appear fixed on some imaginary insect, the course of which, along the walls, he seems to follow, and at which he at last springs and snaps; when the spell is broken, and he returns to his corner as though ashamed.

After a time the violent paroxysms become much longer and more severe, lasting sometimes for several hours, during which the sufferer snaps and bites at whatever he encounters. Not infrequently he will bite and lacerate his own body, even to gnawing his feet to the bone.

During the paroxysms convulsive twitchings of the face are frequently noted, and occasionally they terminate in violent convulsions.

At no time have rabid dogs any special dread of water. All have excessive thirst, and drink freely during the early stage of the disease; but soon they are unable to swallow fluids, hence plunge their muzzles deeply, that the water may reach as far back as possible in their burning throats; but their thirst being unallayed, they become greatly excited, and thus are thrown into a state of fury, and even spasms.

Doubtless this delusion as to dread of water springs from the fact that generally rabid dogs shrink with apparent fear when a pan of water is pushed toward them, and threaten with a fierce growl the person behind it; but it is the act itself, not the water, that excites them, for they exhibit the same disposition when other things are offered them in like way.

That rabid dogs foam at the mouth is an ancient and unfounded tradition.

As long as they can swallow, their mouths are hot and perfectly dry, and it is only after there is difficulty in doing so that the saliva is discharged. Even then it is not in the form of foam, but instead it is stringy and tenacious, or in other words, thick and ropy.

Early in the disease the desire for food nearly, if not entirely, disappears, and it is only rarely and during the first hours that the victim will touch even the most toothsome morsels when offered him. But, as said, he will try to eat, and often swallows in large quantities, small stones, bits of coal, hair, straw, etc. He also has a very decided tendency to devour filth and excreta of all kinds, and has even been known to eat portions of dead dogs.

The indigestibles mentioned remaining in the stomach, that presents after death a condition characteristic of the malady.

As it progresses, emaciation rapidly supervenes, the appearance of the sufferer is sadly changed and most repulsive, even appalling. His coat is staring; his skin is drawn tightly over the ribs, and abdomen tucked up. Frequently his head has swollen, and his eyes, which have sunken into their cavities, are brilliant and glistening. The lining of his mouth, dry and parched, has assumed a purplish color; while on his tongue there is a thick, brownish coating, and his nostrils are glued with a foul and offensive matter. During the intervals of prostration he breathes quite naturally, but in the paroxysms of excitement his respiration is hurried and jerking.

The duration of the maniacal stage is generally not longer than three days, although it may extend into the fourth, and very rarely into the fifth day. As the unfortunate is weakened and the paroxysms grow less severe and distinct, the disease merges into the so-called paralytic stage. The change in appearance now becomes more striking — surprisingly so considering the short time that has passed since the first symptoms were manifested. The eyes have become dim; the tongue, now purplish, protrudes; emaciation has reduced the victim to a mere skeleton; and he presents a heartrending picture. He staggers and stumbles blindly about his quarters, until increasing exhaustion at last overpowers him. He still snaps or bites at things used to arouse him; but, strength departing, his efforts are more and more feeble. His breathing is short and labored. He barks at times, but his voice is nearly lost. He passes into a stupor, or possibly into a partial or complete convulsion, and soon death mercifully closes the scene.

Always rapid, the different stages of rabies may be passed and death ensue on the second day, or life be prolonged until the tenth day; but the latter, set as the limit, is very rarely indeed reached, and from four to five days is the common duration.

The dumb or sullen form of rabies, which constitutes from fifteen to twenty per cent of the total number of cases, is but a peculiar type of the disease, which runs a much shorter course, and without the violent or irritative stage.

There is decidedly less excitation of the brain; the violent paroxysms, the illusions, the constant motion, the disposition to bite, and the propensity to stray, are all absent, or present only in a slight degree, and the animal is quiet, silent, and dejected.

Paralysis of the muscles of the lower jaw is a characteristic symptom of this form of the malady, and manifests itself early in the attack. The jaw drops and the mouth remains constantly open. In rare cases a partial control of the muscles is retained for a time, sufficient to lift the jaw, and possibly allow the animal to bite if sufficiently irritated. Rarely more than a few hours, possibly three or four, elapse after the disease manifests itself before this paralysis appears. There is great difficulty in swallowing, and the poor dog will plunge his muzzle into water up to the very eyes, in order that he may get one drop into the back part of his mouth, to cool his parched throat. In this form of rabies the flow of mucus and saliva is abundant, the same dripping from the open mouth. The voice, changed and of a hoarse tone, is seldom heard, and that peculiar combination of bark and howl, characteristic of the violent form of the disease, is entirely absent.

Death in the dumb form results more quickly than in the other, life being but rarely prolonged more than two or three days. The appearance of the eyes and the generally haggard and depressed look,—marking the derangement of the brain,—the loss of appetite, the rapid emaciation and paralysis, are symptoms resembling those of the violent attack.

Passing in review, the characteristic symptoms of the violent form of rabies are: The marked uneasiness, the delirium and very great excitement occurring in paroxysmal attacks, the tendency to bite, the efforts to break away, the peculiarly changed voice, the perverted appetite, the rapid emaciation, exhaustion, and invariably fatal termination.

In the sullen or dumb form the violent stage is omitted or hardly recognizable; it runs an extremely rapid course; the animals are quiet and depressed; they have but little disposition to bite or run away; early in the disease they are paralyzed in the lower jaw, have changed voice, rarely heard, progressive emaciation and exhaustion, and seldom live beyond the third day.

Preventive treatment must always afford immense satisfaction, even if there is not the slightest occasion for applying it; and certainly no harm could result were every dog-bite cauterized, whether or not suspicious symptoms were exhibited.

Immediately after the bite of an animal presumably rabid, the whole wound should be sucked, and as soon as possible thoroughly cauterized. If there are no abrasions on the lips or tongue, there can be no danger whatever, from the virus, of harm to the one who applies the suction. During the time the lips are employed, the mouth ought to be frequently rinsed with warm water, and the teeth used freely in gnawing, as it were, the edges, to keep the wounded vessels

open and bleeding. To promote a flow of blood, which is decidedly favorable, a cord or handkerchief can be tied fairly tight between the wounded part and the body. The suction should be, if possible, persisted in until the bite can be cauterized, and then, of course, it must be discontinued. If the individual bitten lives at a distance from druggists, and delay must ensue before chemical caustics can be obtained, an iron, heated until it is just beginning to turn red, should be used to burn the wound thoroughly, the fact being in mind that the general tendency is to apply the iron much too lightly, and consequently merely burn the surface, whereas it should go deeply.

The chemical and corrosive agents penetrate to every part of the wound with greater certainty, and when possible they should be secured. The most active are nitric, sulphuric, and carbolic acids, caustic potassa, and nitrate of silver.

Regarding the sucking of a wound made by a suspected animal, it is of interest to recall the fact that in Lyons, during the first twenty years of the present century, certain women made it their business to apply suction to the wounds made by rabid dogs, for which they were paid ten francs for the first operation, and five for each succeeding one. Of thirty-eight persons bitten and subsequently subjected to this operation, not one contracted hydrophobia.

Attention may properly be called here to the absolutely senseless notion that if a perfectly sound and untainted dog bites a person and ever afterward becomes rabid, his victim will also go mad.

It ought not to be necessary to urge that only an animal suffering from rabies can communicate to another the virus or poison of that disease, for in none other does it exist.

He who has been bitten, and, greatly frightened, had the offending dog at once destroyed, has done grievously wrong. Indeed, he has deliberately thrown away his only chance of soon recovering his lost peace of mind; and he will likely now for a long time be in grave doubt and suffer more or less anxiety, through the fear that the dog was really rabid when he inflicted the bite, or about to become so, the seeds, as it were, of the malady being in his blood; whereas, had he allowed him to live, he would have had, in the well dog, the best proof that there was not the slightest occasion for him to be uneasy.

It follows that, invariably, every dog that has exhibited symptoms of rabies and bitten some one should be safely confined, and allowed to recover or die a natural death, that all doubts may be at rest.

In the last decade, and during "hydrophobia scares," the writer has several times discussed this subject in a newspaper with which he was connected, and as often stated in substance as follows:—

The chances of a person giving up his life on a scaffold are quite as many as those of his dying from hydrophobia. No sensible person will ever make himself unhappy over so slight a danger. The hydrophobia crank will find some con-

solation in a small stick of caustic, which he can buy in a wooden holder, securely capped, for about a shilling. Let him carry this in his pocket, with his preventive for rheumatism, the horse-chestnut, and burn all bites of which he is a victim. He cannot do himself any harm, and if he uses it freely enough, it will provide a rare diversion,—at least while it is “taking hold well”—and he will have something else to think about besides hydrophobia.

As for the delusion that rabies is more likely to occur in hot than in cold weather; summer's heat is no more conducive to it than winter's cold, but thirst is conducive to suspicious attacks. Let dogs be strangers to it, and provided always with fresh, cool water in abundance, and symptoms suggestive of the dread malady will be, indeed, rare among them.

INJURIES TO THE BRAIN.

Concussion signifies a sudden shock and suspension of the functions of the brain. Such accident is rare among dogs, but may exist, and be caused by a blow on the head.

Generally the victim lies for a time motionless and unconscious. If an attempt is made to arouse him, he opens his eyes, moves slightly, and is again insensible. After a time in this state his brain begins to recover itself. He grows restless, possibly vomits, and it is then not long before he is walking about; but at first is quite unsteady.

In the most severe cases of concussion the sufferer is, for an hour or more, unconscious of efforts to arouse him. His breathing is slow, pulse quick and feeble, and extremities cold. Vomiting rarely occurs in such.

Death may follow concussion, or recovery may be only partial; the animal remaining physically infirm, with intelligence lessened.

Active interference is not necessary. To keep the head cool and body warm is about all that is required; and beyond this the case should generally be left to nature.

Compression of the brain is usually produced either by effusion of blood, by fracture of the skull with the bones forced in, or by the formation of pus or a watery fluid within the cranial cavity.

The symptoms are substantially those of apoplexy. The treatment required is also much the same as in that accident; that is, in the absence of surgical assistance, which should of course be sought in severe cases.

CHAPTER II.

CONVULSIONS.

AMONG dogs, and especially in early life, convulsions, popularly called fits, are of frequent occurrence.

Epilepsy is the term commonly used to designate such attacks by writers on canine diseases; but such application is open to objections unless properly restricted, for the so-called "falling disease" is a chronic affection excepting in quite rare instances. In other words, a dog cannot rightly be said to have epilepsy until he has had several attacks of convulsions, and the same have recurred during fairly short intervals, and with some approach to regularity.

Of the causes of convulsions in dogs, worms are by far the most common. The nervous systems of some breeds, especially those in which there has been much inbreeding, are highly strung and easily disordered, — even shattered, — and among such dogs, convulsions due to other causes than worms are liable to occur. They may be induced in any breed by indigestion, suckling large litters, intense heat, terrorizing fear or fierce anger, and much meat if allowed without sufficient exercise. Puppies may have them during the teething period, and the attacks be due wholly to the process then going on; but fortunately such accidents are far from common. They may come on, also, in consequence of over-exertion immediately after feeding; and if a long and fast run be taken by a dog that is over-weight and too fat, he would likely fall in a fit.

The liability to convulsions appears to be intensified when the general health is impaired, hence they are somewhat more common in cases of debility, poverty of the blood, etc., and especially while the system is in conflict with exhausting diseases. In acute affections, notably distemper, the convulsive tendency seems decidedly increased.

Numerous poisons, as strychnia and the like, have important places among the causes of convulsions. Such attacks also occur as symptoms of diseases and injuries of the brain and spine; and in irritations, derangements, and diseases of the internal organs, as kidneys, liver, etc., the liability of their happening is somewhat increased.

Finally, there comes the important fact that convulsions are contagious. That is, a dog not previously affected is singularly prone, through the force of imitation, to have convulsions on witnessing an attack in another dog.

In some cases convulsions are preceded by twitchings of the face or limbs,

lasting, perhaps, a minute or a trifle longer; but as a rule, the attacks come on abruptly and without such warning signs. If the victim is at exercise, he stops suddenly, likely remains for an instant fixed, as it were, to the spot, his legs trembling, then he reels and falls, emitting a short, sharp cry or low moan. Possibly he immediately attempts to rise, but if so, falls again, becomes unconscious, and convulsive movements commence at once. The head, limbs, and body jerk violently; the jaws are clamped; the tongue is sometimes caught between the teeth and bitten; and the mouth is filled with frothy saliva or foam, which is frequently tinged with blood from the wounded tongue. The eyes become prominent,—bulge, as commonly expressed. Respiration is either suspended altogether for a short time or is irregular and incomplete; and, in consequence, the mucous membrane of the lips and mouth becomes livid and congested; while involuntary discharges from the bladder and bowels occur in some instances.

En passant, the nursing mother, whose pups are too severe a tax, may suffer from true convulsions, but in many instances her attacks are merely convulsive movements.

When such movements are coming on, she usually pants for half an hour or more, as she would have done had she taken a long run; then there are muscular twitchings, and her legs grow stiff. If on her feet she is very unsteady, and it is not long before she falls on her side, with legs extended. If an effort is made to flex or bend them, they yield easily, but when the hands are removed they return to their extended and stiffened position. The twitching of the muscles grows gradually more pronounced and frequent; but the poor mother does not lose consciousness, and if called, will turn her head in the direction from whence the sound came, possibly whine and wag her tail, and, by the expression of her eyes, give evidence that she fully retains her senses. All this time the panting has persisted; her head is very hot, and her condition generally appears to be one of great discomfort. Frequently she gets up, and, moving about, exhibits a preference for cool, dark places. For an hour, and perhaps for two or three hours, the panting continues, so also the muscular twitchings. Finally these symptoms begin to subside; but it is quite a long time before they have entirely disappeared, and when she returns to her pups, she seems thoroughly tired out. But the following day she is quite herself, and likely remains well for several days, when she again suffers from a similar attack.

A convulsion may be short and quickly over; as a rule, however, it lasts not less than two or three minutes, and may be prolonged for an hour, or even longer.

The victim of convulsions may speedily regain complete consciousness, and in from five to ten minutes be moving about as though nothing unusual had occurred; but in some instances he passes into a profound stupor, in which he remains for half an hour or more.

On returning to consciousness he makes several attempts to rise, reels for a few steps in a bewildered manner, then grows steadier, and soon thereafter is recovered or much improved. In rare cases, however, he appears delirious for a time, and rushes off wildly or toward those about him.

Premature whelping brought about by blows, kicks, or other injuries to the abdomen, also deliveries at term by force, — the pups being too large, — are sometimes followed by puerperal tetanus, which is characterized by signs resembling somewhat those that appear during an ordinary attack of convulsions. But mistake should not be easy with the careful student, for in some respects the difference is sufficiently marked.

The duration of a convulsion depends much on the cause. When the attack is epileptic, and other attacks like it have previously occurred, it is generally short, and soon entirely over.

If occasioned by worms, it generally lasts five minutes or longer; and the duration is about the same where the attacks are attributable to indigestion, debility, etc., or they are complications of disease, as distemper. When induced by strychnia or like-acting poisons, the convulsions usually keep up until death occurs, or is near.

Convulsions occasioned by this poison are at first somewhat different from those due to other causes. For instance, the spasms are intermittent. That is, the muscles are convulsed, then they relax, and remain so for a few moments, when the convulsion is again on in all its intensity; and during the spasms the back is bowed. At first, also, and for a short time, during the intervals of rest, the sufferer often whines or cries when touched; and if a door is opened and a gust of wind strikes him, it will generally bring on a spasm. It is not long, however, before consciousness is entirely lost, and the convulsions thereafter differ but slightly if any from the common form.

Notwithstanding the frequency of convulsions among dogs, and that the conditions and influences capable of exciting them are many and varied, the fact is plain that worms and poisons are the causes in much the largest proportion of cases — so large indeed that when a puppy is attacked it is fairly safe to assume that he has worms. The same may be said of the matured dog constantly kept in kennels. But when convulsions occur in dogs permitted to run at large, the chances are that they have been poisoned; and one may rightly act on that assumption after an attack has persisted for about ten minutes, for if it had been caused by worms, it would likely have ended or begun to subside.

The chances of recovery from convulsions depend upon the causes which induce them. Death rarely occurs from such attacks alone, although possible from suffocation; and generally where the result is fatal, it is attributable to the condition or disease that caused the spasms. For instance, such an attack coming on during the course of distemper and terminating in death, the end would be due to that disease, not to the convulsions. So, too, where strychnia

had been taken, if death resulted it would be caused by the poison and not by the convulsive attack, which was merely a symptom.

A simple epileptic convulsion or similar attack brought on by worms, indigestion, fear, or other derangement, does not require special treatment, because it will likely soon be over with; yet it is a wise precaution always to secure the victim, lest he be delirious, and run away after it has passed off.

To cool the head by bathing with cold water, and keep the body and limbs warm by ample coverings or friction with the hands, — thus diverting the blood from the brain and lessening the temporary congestion therein, — are the simplest measures of treatment; and they can always be applied by those who choose to interfere.

After the convulsion has ended, if the victim seems sluggish and disposed to sleep, he should be left to himself.

One can rarely anticipate with anything like certainty whether or not a convulsive attack will soon be recovered from, — being unable to tell whether it is due to simple derangement or to poisoning, — therefore, in all cases, as soon as possible after the spasm has commenced, provisions should be made for serious trouble.

The first step to be taken is to despatch a messenger to the nearest drug store for at least four ounces of ether. Also for a mixture of chloral hydrate, consisting of two drachms of the same in two ounces of water.

As this mixture must be administered by injection, it will also be necessary to obtain of the druggist a glass syringe which will hold at least half an ounce.

When a convulsion has lasted over five minutes, the caretaker should commence to administer the ether in the following manner: —

First secure a piece of muslin or quite thin cloth, — a lady's handkerchief will answer admirably, — and press the same to the bottom of a teacup. Now moisten it with ether, invert the cup, and hold it over the sufferer's muzzle; let it remain there for about half a minute, then move it away a short distance, keep it away for a few seconds, and again apply it. Thus he will take a few whiffs of the ether, then a little fresh air, again the ether, and so on; whereas he might strangle were the ether administered too quickly.

By keeping the cup always bottom upward the ether will not evaporate nearly as fast as it would were the dish right side up; but still it will be necessary to moisten the handkerchief with the anæsthetic every two or three minutes, since it passes off into the air so very quickly.

Every case of convulsions can be stopped with ether if enough is given; and when given it should be pushed or persisted in until it does its work, and the convulsions cease or are subsiding rapidly.

Having once stopped, only in desperate cases — as of poisoning or grave disease of the brain — are they likely to recommence as soon as the effects of the ether are wearing off.

The chloral hydrate mixture can be used instead of the ether, or with it. When made up in the proportion advised, each tablespoonful of it contains thirty grains of the chloral hydrate; and that quantity is sufficient for injection for any dog of medium or large size; while one-half of it, or two teaspoonfuls, would be about right for dogs about the size of fox-terriers, and one teaspoonful for toys.

If the glass syringe to be used holds more than the quantity of the mixture that is to be given, first draw up with it the proper dose of the medicine, and then enough water to fill the syringe. Enter the tip of the syringe into the rectum, force it up as far as it will go easily, and then gently press the piston.

When all has been injected, quickly withdraw the end of the syringe, and stop the passage into the bowels with the "flat of the thumb," keeping the same in place for at least ten minutes. Thus expulsion of the medicine from the bowel will be prevented.

If in the course of fifteen minutes the spasms are very evidently subsiding, a delay of perhaps five minutes would be justifiable; then, if they have not ceased altogether, or seem quite certain to do so within a few minutes, another like injection of the chloral hydrate mixture should be administered, and be repeated every fifteen or twenty minutes as long as the convulsions last.

In strychnia poisoning, if nothing be done, the spasms are likely to keep up for several hours, and until ended by death; or if stopped by treatment, for a time they are liable to return if the same be at once discontinued. The chloral hydrate mixture should be given every fifteen minutes until the convulsions have ceased, also, frequently, a few whiffs of ether if the chloral mixture fails to act speedily; and these measures be again resorted to in event the spasms threaten to return.

As soon as an attack of convulsions is over, and the victim is nearly or quite recovered from its effects, every effort should be made to discover the cause, when of course appropriate treatment must be applied. For instance, if the cause is a too heavy drain from suckling large litters, the pups should be permanently withdrawn, and the mother liberally fed, also strengthened with tonics; and so on with each cause. In no small proportion of cases, however, there will be decided doubts as to its identity; in which event it will be advisable to assume that the trouble is worms, and administer the essential remedies.

Cases of epilepsy, — that is, cases in which the convulsive attacks are habitual and recur at intervals — are fortunately very rare among dogs, for a cure would scarcely be possible.

When a dog has a convulsive tendency which seems assignable only to extreme nervousness, a generous diet and hard work is indicated. As for medicinal treatment for such, the bromide of potassium is generally recommended by writers. Its beneficial effect has, however, been greatly overestimated; and although it can scarcely do any harm, the chances of its doing good are very small indeed.

The oxide of zinc is a more potent remedy for nervousness and nervous affections than this, and it might be given twice daily. The dose for a dog of medium size is two grains ; for largest breeds, three grains ; for small breeds, as fox-terriers, one grain ; and for toys, one-half a grain.

To have any marked effect, in nervous cases the zinc must be given regularly for a month or more.

VERTIGO.

Vertigo, dizziness and giddiness, is an occasional symptom among dogs. Occurring in man, sometimes his own head seems to be turning around, while at other times everything in sight appears to turn instead.

When a dog suffers from an attack, it is as a rule immediately after he has been lying down. He starts up as usual, but stops while rising, then slowly lifts himself, as it were, onto his feet, with difficulty and hesitation. Once on all fours he takes a few steps, but reels like one intoxicated, and spreads his legs apart to prevent falling. He also closes his eyes for a moment, and likely there are a few slight twitchings of the head, which may sway to the side. For perhaps half a minute he seems afraid to move ; then suddenly shakes himself, and generally starts off as usual ; although sometimes vomiting first occurs.

The most common cause of vertigo is indigestion, accompanied by a disturbance of the liver which may come under the head of "biliousness." It may be associated with trouble in the internal ear, also occur as a symptom of general debility, and more often of brain affection. A collar so tight that it interferes with circulation, and consequently causes congestion of the head, may induce an attack.

Manifestly the removal of the cause is the all-important requirement in treatment ; and this is effected in most cases by a generous dose of Epsom salts, castor-oil, or a mixture of the syrup of buckthorn and sweet-oil. Although other medicines may be needed in a small proportion of cases, correct feeding, judicious exercise, and better management all around will generally suffice to effect a cure after the bowels have been well swept out by the cathartic.

APOPLEXY.

The term apoplexy signifies a sudden attack, characterized by loss of consciousness and profound stupor ; and the same is commonly called a stroke or shock.

It is usually abrupt in its occurrence ; and while the victim may seem to retain

some degree of consciousness, as a rule its loss is complete. The most pronounced symptom appears in the breathing, which is slow, heavy, and noisy; loud snoring being more or less constant. The eyes are bloodshot and fixed; the mucous membrane of the mouth is of purplish hue; and the pulse full, hard, and slower than in health.

In much the largest proportion of attacks there are either convulsive twitchings or severe spasms.

Apoplexy in man is generally caused by the rupture of a vessel in the brain, from which the blood pours, and by pressure produces the characteristic symptoms. But attacks occurring among dogs are generally due to sudden and very severe congestion of the brain, consequent upon great excitement, as fear or anger, violent straining or exercise, intense heat, and the like. For this reason, and because the brain trouble is only temporary, the attacks usually quite speedily terminate; whereas were they caused by rupture, as in man, until the pressure was removed recovery would not be possible.

A predisposition to apoplexy is created by over-feeding and want of sufficient exercise.

To keep the body warm and head cool are the primary essentials in the way of treatment. If there are spasms, and they persist over seven or eight minutes, ether or chloral hydrate should be administered, as advised in the section devoted to consideration of Convulsions. Beyond this no general line of treatment can be recommended, and efforts should be restricted to overcoming disturbing symptoms as they arise.

In rare cases, paralysis of certain parts remain after consciousness is restored and the victim is on the mend. Improvement in such is possible, but complete recovery is never likely to occur.

HYDROCEPHALUS.

Hydrocephalus, which is literally water in the head or dropsy of the brain, is occasionally seen among puppies, and then generally at birth. As a rule, it is attributable to grave faults of constitution in either the sire or dam, or both; and such faults are akin to debility, rickets, scrofula, and the like.

The victims generally die speedily; which is fortunate, for really nothing can be done for them.

SUNSTROKE

Under the influence of great heat, and especially the scorching rays of the sun, dogs sometimes suffer from much the same symptoms as those noted in

members of the human family when similarly exposed; hence without impropriety it may be said that they are sometimes victims of sunstroke.

En passant, it is well to draw attention to the fact that there is a popular delusion about sunstroke that should be dispelled.

It is not occasioned exclusively by intense heat from the direct rays of the sun, but other causes are generally combined to produce the result, such as over-exertion and consequent exhaustion. In fact, the affection known as sunstroke may occur in the night. Indeed, attacks between the setting and rising of the sun are not uncommon in large cities, among the poor people who are confined to small and ill-ventilated quarters. Again, atmospheric influences other than heat are involved in the causation of sunstroke. A hot, dry air is more easily endured than one of lower temperature but loaded with moisture. For instance, in Dakota men can work all day exposed to the sun when the thermometer stands much over 100°, and yet in New York, on a cloudy, wet day in August, with the temperature only 95°, large numbers of men and animals have been prostrated.

As stated, dogs when exposed to intense heat in summer, suffer from symptoms much resembling those appearing in man under similar influences. But there is this difference, which exists in nearly all, but not all, cases. When man is overwhelmed by the heat he may become delirious and have convulsions, but such instances are very rare; and almost always he passes into a profound stupor, as when stricken down by apoplexy. Dogs, on the other hand, commonly suffer from convulsions as a consequence of intense heat. As a rule, they pass gradually into them, and during the early stage there is twitching of the muscles, and often great excitement that borders on frenzy. In this wild state they run blindly about, snapping their jaws, frothing at the mouth, etc. As one might say, they act as though they were going into a fit; and they almost always do have such an attack unless relief comes promptly; moreover, the convulsions frequently prove fatal.

It is while in this condition of threatened spasms that so many perfectly harmless dogs are accused of being mad and ruthlessly butchered. In truth, for no nearer approach to rabies than this are communities often terrorized and thousands of dogs slaughtered yearly.

All dogs do not suffer alike from intense heat. Furthermore, certain influences lessen their ability to resist it. Improper feeding, and more especially of too much meat, has a baneful effect on the resistant powers; so, too, does exhaustion, either physical or mental. For instance, if a dog becomes very much excited and is long under the strain, he is in a condition in which it is easy for him to be overwhelmed by heat. A long hard run afield also renders him liable to the accident.

Closely confined dogs more often succumb to the heat than others at liberty. This is especially the case with sporting dogs, for if unrestrained they naturally

seek water, and find there some relief if it is only a puddle. That nursing mothers are now and then victims of heatstroke is not surprising, because their susceptibility seems greater than when not with young.

The list of affections that have been clearly proved to be caused by germs has been lengthening quite rapidly of late, and the fact can scarcely occasion surprise that an effort has been made to add sunstroke to it. Not long ago a micro-organism was discovered in the blood of victims of this accident, and the claim at once entered that the bacillus in question was the specific cause of it. Further support of this theory is, of course, necessary before it can be generally accepted, and until that has been furnished, the influences assigned as causes may rightly be considered important factors.

Among the most marked symptoms presented at first are panting and extreme restlessness. There is fever, which quickly grows more pronounced, until the skin is intensely hot. It is then that the convulsive movements commence, and they may persist for an hour or more before a true convulsion occurs.

The muscles of the foreshoulders are first affected; then the hind shoulders, and finally nearly every large muscle is more or less involved. In the meantime the patient usually emits a husky moan, thus indicating that certain parts of the throat are affected; and in rare instances he howls dismally.

He is conscious at first, and walks about, but unsteadily. After a time a glaring expression of the eyes is noted. Then snapping of the jaws follows; and he either falls in a fit or runs wildly about. And often, but not always, he runs in a circle for a few moments before the convulsion comes on.

In some cases it soon passes off. In others, more severe, the victims lie for hours afterward, at frequent intervals moving their heads from side to side, much as a child does who has disease of the brain. Finally consciousness returns, but only slowly, and for a long time the poor dogs stagger about dazed and spiritless.

The treatment to be pursued in sunstroke is simple, and should be speedily effective if commenced early.

Mindful of the danger that dogs are in during very hot weather and while exposed to the heat, the conscientious caretaker would, of course, be on the alert, and promptly act as soon as the first threatening symptom occurred, which is a twitching of the muscles.

In heatstroke the body is literally burning up, and the fire must be put out, — the fever be as quickly subdued as possible. A full bath is the means to be employed, and for the purpose a washing-tub may be called into service if one is at hand.

The fact should not be forgotten that the patient's brain is in a very excitable state, that convulsions are imminent if they have not already come on, and there is danger in shock, such as would be produced by the sudden application

of cold water, which it is necessary to use in such cases to reduce the temperature of the body. Therefore, for the general bath, tepid water must first be employed. In this the dog should be laid or stood, and sponged until his coat is thoroughly wet; after which he may be drenched. In the meantime an assistant should be sponging his head with water just a little colder than that in the tub.

By judiciously adding at first cold water and finally ice, the temperature of both the water in the tub and that used on the head can be gradually and quite rapidly lowered without causing shock or exciting the patient, until the former is as cold as it comes from the well, and the latter is ice-water; by which time the heat of the body will be greatly reduced, and the bath likely have occupied about twenty minutes.

There is some danger of crossing the line and chilling the patient, therefore the bathing should soon cease after the waters have been cooled as advised; and if the work has not been well done and the fever properly controlled, it may be repeated in the course of fifteen or twenty minutes.

If one is far away from home with his dog and heatstroke threatened, he should disregard the chances of shock and plunge him into the nearest watering-trough or pond, or pump cold water first on his head and afterward over his entire body. In no case should there be any delay, since the danger is great. If the dog becomes convulsed, the same treatment should be employed; and if the fit does not speedily pass off, injections of the hydrate of chloral should be administered, as advised in attacks of convulsions.

That some modifications in the feeding of dogs are imperative during hot weather it ought not to be necessary to urge. They should be given only such quantities of food as are necessary to keep them healthy and strong. Meat is very stimulating, and should be fed sparingly in summer; while well-cooked vegetables, in puddings made of the different meals, are recommended as admirable substitutes.

To dogs that are out of condition because of being too fat should occasionally be given a small or laxative dose of magnesia, Epsom salts, syrup of buckthorn, or something of the sort; also a cold shower or full bath each day.

Manifestly a requirement of infinite importance at all times, and especially in hot weather, is fresh, cold drinking-water; and he who furnishes his kennels with an abundant supply is not likely to have much experience in sunstroke.

CHAPTER III.

ACUTE MENINGITIS.

THE brain is enveloped by membranes or "meninges," and these are generally affected in cases of so-called inflammation of the brain. Hence that inflammation is termed meningitis; acute if recent, and chronic if of long standing.

There is sound basis for the belief that dogs are quite frequent sufferers from acute meningitis; moreover, that cases of it are very generally mistaken for rabies.

Considering that there is widespread a most pitiable terror of the latter, that it is excited by the merest shadow of a pretext, that while it exists reason is dethroned, that there are many inseparable delusions, also that in certain stages it is extremely difficult to discriminate between it and simple acute meningitis, such mistakes cannot occasion any surprise.

Among the known causes of this affection are blows on the head and consequent injuries to the brain, intense cold, sunstroke, frenzy from fear or anger, and extension of inflammation from adjacent parts. It has had its origin in diseases of the ears and eyes, and has occurred as a complication of certain constitutional diseases, notably distemper, which seems to create a decided predisposition to it.

While now and then the cause can be determined with reasonable certainty, much the largest proportion of cases are of mysterious origin, and they develop without any indication whatsoever of even the direction in which it lays or the general nature of the cause.

No age is exempt from the disease; but it seems to have a preference for mature subjects, and occurs more often among females than among males.

In rare cases the victims of acute meningitis for several days appear to be ailing; but, as a rule, the disease comes on quite abruptly. That is, the unfortunates may seem well in the morning, and suddenly, or within two or three hours, be manifestly very ill.

In instances of gradual approach, the poor dogs are a bit restless, and in moving about carry their heads low. They turn from their food, and one or more attacks of vomiting occur with some of them. Their sleep is dreamy and disturbed; and during it their legs twitch, and they emit at times short cries or barks. On examination they are found to have a hot nose, some fever, and quite rapid pulse.

Where the onset of the disease is abrupt, the first symptoms manifested are those of active congestion. The victim is very restless and irritable, and evidently at times does not recognize those about him or know what he is doing. In other words, he is delirious. He shakes his head occasionally, and rubs the side of it along the ground or floor; and now and then while doing so whines or cries piteously, thus indicating the location of the disturbing trouble. A symptom which plainly suggests rabies appears in his disposition to crawl under furniture or seek dark places, he evidently being sensitive to the light. That he is mad would also seem certain because of his peculiar susceptibility to sounds, and the excitement that they induce. He sleeps lightly, and is easily awakened; and when disturbed he starts up wildly, and makes a dash in the direction from whence the sound came, barking or growling as he does so. For perhaps a minute he continues to rage, then slinks back to his dark corner or nook.

A dog in the first stage of rabies is not likely to bite his caretaker unless an effort is made to restrain him; but some victims of acute meningitis, even in the earliest stage, seem unable to recognize friends; for when wildly excited they bite any one within reach, whether intimate or stranger.

In meningitis the voice is altered; the eyes are glistening at first, and vacant in expression; and the sufferer barks and snaps at imaginary intruders; also bites at sticks extended to him.

In meningitis, as in rabies, the violence and maniacal excitement occur in paroxysms, with intervals of comparative quiet. In both, also, convulsive movements are experienced; there is snapping of the jaws and champing of the teeth, and not infrequently general convulsions come on, and last for ten or fifteen minutes unless controlled by ether.

There is constipation in acute meningitis. For a time the hearing power remains unimpaired, and if not thrown into a rage when called, the dog raises his head as though listening; but apparently unable to appreciate from whence it comes or the significance of the sound, he does not respond.

When on his feet, if confined to a room, he circles around it, sniffing at the walls, and at times stops and barks for several minutes.

While maniacal excitement and quite violent delirium are the rule in the early stage of acute meningitis, there are notable exceptions, and in those the victims appear dull and stupid. Or at least they are not easily disturbed or conscious of goings on about them, which would, in the other cases, be quite sufficient to bring on fits of frenzy. And these quiet subjects but rarely if ever show any disposition to bite man or animals.

Acute meningitis has not been on long before the victim's legs tremble under him, showing increasing weakness. Liquids he drinks readily and with feverish rapacity. Vomiting frequently occurs; the eyes are bloodshot, the face haggard, the pulse quickened, and the temperature of the body notably raised. Restlessness is a marked symptom in this stage. The writer recalls the case of

a young mastiff, afflicted with the disease, which he allowed to run at large within his house, that the symptoms might be carefully observed by the inmates. This dog, while he had strength to make the distance, had a certain point to which he invariably journeyed. He would start from his bed in the kennel-man's room, climb three stairs, enter the kitchen, pass from there into the dining-room and stop at the hall door; then, without pausing, would take a direct course back; and on reaching his bed, again turn and travel precisely as before, always making for the same points, and never deviating or passing through other doors or going beyond his self-imposed limits. Other dogs lay about the rooms undisturbed and unnoticed. At first his journeys were made on an easy walk, with head carried low; ere long he entered a run, which he kept up until exhaustion overcame him; then for a brief interval he remained quiet, and when his strength returned he again started on his wearisome run. The inmates of the house would occasionally meet him on his journeys; without any disposition to bite, he would deviate only sufficiently to pass them, and continue on. For two days only had he strength to climb the stairs, but, until he died, some three days later, he frequently made feeble efforts to do so.

The stage of active congestion in dogs suffering from acute meningitis is short, and rarely more than two or three days; then the symptoms change, as an effusion forms within the cranial cavities and presses upon the brain. Drowsiness succeeds the maniacal excitement; the sight becomes dim or is wholly lost; obstructions are no longer avoided, but blindly encountered. In his movements the animal seems wholly unconscious, crazed as it were; his bark is low and feeble; he still drinks if his nose is guided to the basin; the intervals of quiet lengthen; he rises to his feet with difficulty, his legs weak and trembling; the stupor grows more profound; paralysis ends his tiresome walks; convulsions are frequent and severe; death finally brings relief.

The disease may run a fatal course in two or three days, and but rarely does it extend beyond six or seven.

From the foregoing symptoms it will be appreciable how easy it would be for an observer, unfamiliar with the manifestations in both diseases, to mistake acute meningitis for rabies. It must also appear difficult, if not impossible, for even an expert to discriminate with positive certainty in all cases. Unfortunately the prevailing disposition is to sacrifice dogs on the first appearance of symptoms barely suggestive of rabies; and yet to kill an animal suspected of being mad is not the first but the last thing to do if he has bitten any one. He should be secured, and every possible precaution taken to prevent injury to those around him, and thereafter be carefully watched. Many a mind has been nearly crazed by days of terror and horrible expectancy which might have been averted had not panic-stricken friends hurried the poor dog out of the world, instead of allowing him to die naturally, when it would have appeared plainly evident that he had meningitis merely, or other disease quite as innocent.

The manner of the attack will aid much in reaching a diagnosis. Acute meningitis generally follows an accident, injury, or exposure, or is developed in connection with some other disease. There is no melancholic stage, as in rabies, no shrinking from strangers; the disposition to worry articles, carpets, chair-legs, etc., to eat indigestible substances, to lap urine, cold stones, and iron, to stray away or attack other dogs, are all absent in meningitis. Again, while the voice is altered, the bark is short, sharp, and high in pitch, entirely unlike the hoarse, croupy, blended howl and wail heard in rabies.

In that malady, wood-work is bitten, straw shaken in the teeth of animals infected, and sticks thrust at them are snapped at savagely, and clung to so fiercely they can be loosened only with great effort. In meningitis these symptoms are absent. A sufferer from it bites at a stick extended, but almost immediately relinquishes it. Another important diagnostic difference is, while maniacal excitement occurs in paroxysms, not often can it be induced by worrying, as it would surely be were the victim mad.

In rabies there appear peculiar illusions. The unfortunates see, as it were, bugs, spiders, or the like, crawling along the walls, and follow them with their eyes in their imaginary course. This symptom does not appear in meningitis; neither is there a constant disposition to bite other animals, as is the case in rabies. In the former affection vomiting generally occurs; and one more important fact to be accentuated is, that it is an inflammatory disease, consequently the febrile movement is more or less marked; while fever is not a symptom of rabies.

Acute meningitis is a grave disease, and recovery but rarely takes place. When developed in connection with other disorders, as distemper, the danger is intensified, and the chances are small indeed.

A dog that exhibits its symptoms should be secured; and a measure of anxiety will be removed if care in handling is observed. The timorous can use heavy buckskin gloves, and will doubtless feel safer for it, although after the presence of meningitis is positively determined, such precautions are needless.

Perfect quiet should be enforced. The food to be relied on is milk, and that should be often put before the sufferer.

When inactive, the bowels ought to be moved every second day by a cathartic.

If convulsions occur and threaten to persist, ether may be administered.

Since the chances of combating this disease are so few, and after a time a professional must be in quite constant attendance, to draw the urine with a catheter, if for no other purpose, the discussion of remedial measures need not be carried further. And even were recovery to occur, the cure would not likely be complete; consequently other treatment than is necessary to lessen the amount of suffering as much as possible cannot be encouraged.

CHRONIC MENINGITIS.

Inflammation of the membranes of the brain may assume a subacute or a chronic form. That is, it may have some resemblance to acute meningitis, or, as a chronic affection, differ quite radically from it.

Chronic meningitis comes on insidiously, and usually its presence is not for a long time detected, the symptoms being attributed to some other disease.

To determine the cause of this affection is difficult, if not quite impossible in many cases. Injuries to the head, however, are doubtless largely instrumental in exciting it, and now and then it occurs during the course of disease of the kidneys, which evidently lays a foundation for it.

In true epilepsy the existence of chronic meningitis may rightly be suspected as the cause of the convulsions.

Certain diseases may exist within the head for a long time without exciting symptoms of trouble. And where there is chronic inflammation of the meninges of the brain, the symptoms present may be so confusing that it is not possible to determine positively the true nature of the existing disease.

If a dog's disposition changes, he gradually grows dull, stupid, and disinclined to exertion, sleeps more than usual, has occasional convulsive movements, — possibly confined to the mouth, — carries his head low, his eyes become vacant in expression, dim in sight or sightless, his movements when on his feet are erratic, and it is known that sometime in the past he has experienced a severe blow on the head, then chronic meningitis may with reason be suspected. These symptoms are common to a variety of affections of the brain, but when following an injury, the membranes are more often affected than the brain substance.

The treatment consists of mild laxatives, blisters or setons to the back of the head, perfect quiet, nutritious diet, the iodide of potassium in from one to five grain doses, three times daily; and possibly after this agent has been used for several weeks, strychnia can be wisely substituted. The appetite and general condition of the animal will indicate whether quinine and iron need be added to the strychnia.

Unless the patient is valued highly, it were better to sacrifice him as soon as it is apparent that he is suffering from chronic meningitis, or indeed from any long-standing affection of the brain; for all the chances are that he will drift to the end, and treatment, no matter how skilful, will scarcely delay his progress.

CEREBRO-SPINAL MENINGITIS.

Cerebro-spinal meningitis, often called spotted fever, is quite different in character from the acute form of meningitis already discussed, and is analogous

to fevers, like distemper, in which the disturbance is general, throughout the system, not local merely.

In acute meningitis the inflammation as a rule is at the top of the brain, — just underneath the roof of the skull, — whereas in the disease under consideration the inflammation is at the basis of the brain, and extends some distance down the spinal cord.

It is not a common affection among dogs; although there is basis for the belief that cases have occurred and its true nature not been detected; the attacks being credited to other affections, or held to be mysterious.

It is defined as a specific infectious disease of microbic origin. That is, its real cause is a morbid germ. But while it is undoubtedly communicable from one dog to another, it is evidently not easily so; and for dogs to contract it they must be in intimate and prolonged contact with a sufferer. In other words, a well dog may be under the same roof with the sick without "taking" the disease, provided they have separate compartments, feeding-vessels, etc.; but were they mates, occupied the same room, slept on the same bench, and ate and drank from the same dishes, the chances of the well becoming infected would be quite great.

Epidemics have occurred in kennels, and but few therein escaped the disease; but the histories of such seem to indicate that instead of its being conveyed from one inmate to another, as a rule the inmates acquired the poison from outside of the kennels, and all about the same time.

While the actual cause of the disease is a specific poison or germ, the chances of infection are greatly increased by certain external conditions; and where the kennels are cold, filthy, or damp, the inmates are crowded, and their food or drinking-water is bad, the germ finds the most favorable soil and easiest victims. Whereas healthy dogs properly managed, kennelled, etc., would be able to resist it and the disease to which it gives rise.

There are certain local conditions which are favorable to the entrance and development of the germ in question. Inflammation of the internal ear, for instance, is liable to extend and involve the membranes of the brain; thus while it exists, there is a door open through which the germ may enter and find its work easy. And the same may be said of every inflammation in the nose, mouth, or throat.

Whether or not this germ can reach the system from the stomach or intestines is an open question; but it is probable that it might enter with the food or drink, and find the conditions favorable to its growth and entrance into circulation, when, of course, cerebro-spinal meningitis would be the result. It is also probable that entering the mouth and nose, in the air, either along the passage to the lungs or in the lungs, it finds a way into the system, where it can do its baneful work.

Cerebro-spinal meningitis begins suddenly and with symptoms that are indic-

ative of a serious sickness. The limbs tremble; and the skin is hot. Usually the victim vomits several times. Soon after the onset of the disease he appears dazed and unlike himself. He paws at his head as though disturbed by trouble therein, and at such times moans or emits short, sharp, shrill cries. Decidedly "dumpish" from the first, he at times arouses for a few moments and acts quite wildly — standing on the alert listening, or dashing off, then stopping suddenly and barking at an imaginary intruder. But violent demonstrations are soon ended, for he stiffens rapidly, and gets up and moves about with difficulty, dragging his hind legs, and carrying his head without turning, as though it was fixed to his body with splints. His sight and hearing are also impaired, and soon apparently lost altogether.

He is quiet much of the time, but is in a stupor rather than asleep; and occasionally he stiffens, with head thrown back, legs extended, and all muscles rigid — suffering from a convulsive movement.

That he is sore all over as well as stiff is apparent if effort is made to raise or move him, for he then cries out as though in great pain. The fever, in the beginning intense, usually moderates; and in occasional cases it almost wholly disappears for a time. The bowels do not move voluntarily at first; and in severe attacks the urine is retained.

In some cases, but not in all, about the third day an eruption appears; and this may have the appearance of flea-bites, or be of much smaller size, and of deep red or purplish color.

If the case is to end in death, which is the rule to which there are but few exceptions, it is in sight by the third day; when all the symptoms are greatly aggravated. The tongue is dry, glazed, and perhaps cracked; the fever has returned with much greater intensity; the convulsive movements are more frequent, or real convulsions occur; and the stupor has grown so profound all efforts to arouse the sufferer are ineffectual. Diarrhœa may then follow constipation, the flow of intestinal matters from the bowel being unobstructed and continuous.

These are the symptoms presented in an ordinary attack, but they may vary considerably in different cases, some of which progress so rapidly and with such violence that death occurs within a few hours, usually during an attack of convulsions; whereas in others it is delayed until the fifth or sixth day. Again, the nervous system may be soon overwhelmed, and the victim thereafter remain in a profound and unbroken stupor; or for a day or more he may be wildly delirious and his symptoms greatly resemble those of acute meningitis. But the disease is so rare an elaborate description of the different forms cannot be expected, and that of the common form should be quite sufficient.

The chances of recovery from cerebro-spinal meningitis are so small treatment cannot be encouraged excepting in cases in which improvement is made after the fourth or fifth day; and even in such, to enforce perfect quiet and sustain

the strength by suitable food, is about all that can be recommended, aside from meeting exigencies or symptoms as they arise, as diarrhœa, convulsions, etc.

The fact that the disease is contagious need not cause any uneasiness, because the extent to which it is so is very slight; and if dogs are kept from immediate and prolonged contact with the sufferer they are not likely to become diseased through him.

TETANUS.

Tetanus is an acute disease of the nervous system characterized by continuous tonic spasm or rigidity of certain muscles, with paroxysms in which the spasms are more intense and violent.

Attacks of this distressing malady may be general or partial, and when the latter, it is mostly confined to the neck and jaws; hence it is popularly termed lock-jaw.

Tetanus is due to infection by a specific poison or germ, known as the tetanus bacillus. This is always introduced through a wound or break in the skin or mucous membrane, where it generates a poison which gives rise to the characteristic symptoms.

The wound through which the germ enters is in some cases so trifling that it may have healed completely before the symptoms of the disease have developed.

That wounds contracted in a certain manner are far more liable to be followed by tetanus than others is a fact long recognized. For example, those that are small but deep, and produced by rusty nails or splinters of old or dirty wood, or wounds of the foot or hand into which dirt or filth has penetrated deeply, have been considered specially dangerous because of their tendency to cause lock-jaw.

It seems that it is in the shallow wounds that the germ finds the conditions least favorable for its work; and this is explainable when the fact is considered that the poison of the disease is quickly destroyed by the sunlight.

Accepting the real cause to be a germ, exposure to cold, intestinal disturbances, and other debilitating conditions to which tetanus was once believed directly due, must be held as predisposing influences merely.

This disease sometimes occurs after whelping, and is then called puerperal tetanus. It is exceedingly rare, however, excepting in cases in which the whelping is premature in consequence of injuries inflicted on the abdomen, as by kicks, or at term when the pups are too large to be delivered naturally, and their removal can only be effected by considerable force.

Tetanus also sometimes occurs in pups within a few days after birth, but only very rarely unless the whelping quarters are exceedingly filthy.

The period commencing with the occurrence of the injury and wound and

ending with the first symptoms of tetanus, varies greatly in length; and while it is usually less than five days where the disease is puerperal or attacks the new born, in other classes of cases it is generally from five to ten days.

Usually the first symptom noted is stiffness in the movements of the neck or jaws. A few hours later the jaws are, as a rule, firmly fixed and cannot be opened by the sufferer, nor without considerable prying. Owing to rigidity of the muscles of the neck, the head is set as though in splints, and bent backward. Gradually the trouble extends and involves the muscles of the back and hind legs, and when they have become rigid the spine is arched backward and bent like a bow, while the legs are extended, and only movable with difficulty.

The muscles of the face share in the general affection. The angles of the mouth are drawn backward and downward, and the upper lip is stretched over the teeth, producing hideous distortion.

Rigidity of the muscles is almost persistent, but occasionally it lessens a little, while now and then it is for a time intensified in marked degree, and the sufferer appears as though in a violent convulsion.

The temperature of the body may be at first nearly normal, but as the disease progresses high fever comes on; the pulse grows rapid and weaker; the body is bathed in a profuse cold sweat; and soon thereafter the terrible sufferings are ended by death.

In some cases death results from exhaustion, the nervous system being worn out; in others it is caused by heart failure, or by suffocation, respiration being too long suspended during a paroxysm. Only in exceedingly rare instances and very mild cases does recovery occur; and then one is slow to believe that the existing disease was really tetanus.

The duration of the malady is variable. Life may be prolonged for ten or twelve days, but the most of the fatal cases terminate between the second and fourth days.

The symptoms of tetanus resemble somewhat those of strychnia-poisoning, yet mistake ought not be easy. Tetanus comes on quite gradually, the stiffness or spasms beginning in the neck and jaws; and it is not until several hours afterward that the latter are perfectly rigid and the muscles of the back and legs are involved by the spasm. Whereas, in strychnia-poisoning the effects are manifested suddenly, and the symptoms are at once severe; the muscles of the legs are first stiffened, and then the spasm speedily becomes general and violent. Finally, in this poisoning, death or recovery usually takes place within a few hours.

The chances of recovery from this disease are so small it would scarcely be wise to attempt treatment unless the sufferer was valued very highly; otherwise to destroy by means of chloroform would be a merciful act.

Where an effort is made to cure, perfect quiet should be enforced, and inhalations of chloroform and ether, in equal parts, be at once administered,

while a solution of the hydrate of chloral is being prepared. That solution should be of the same strength and doses advised in convulsions.

Of all agents employed in tetanus it has proved the most efficient; and it should be pushed fearlessly, the injections being repeated as often as every half-hour until improvement is noted, or it is plainly evident that the case is hopeless.

Calabar bean and curarine have been used on man successfully in a number of cases, and of course might be tried on a canine sufferer if other means had failed, a physician was in attendance, and these drugs were obtainable.

Every three or four hours nourishment should be given by injection: and the same may rightly consist of a cupful of milk or beef tea, with a raw egg beaten in, and a tablespoonful of brandy.

During the past year or two this disease in man has been very closely studied by physicians, and at present many experiments are being made with the so-called tetanus antitoxine. By means of injections of this, animals have been so immunized that they have failed to develop tetanus. It has also been used successfully in the treatment of a few cases. Which facts encourage the medical world to hope that at last a cure for this dread malady has been found in antitoxine serum. But, of course, further experience will be necessary before all doubts can be at rest.

CHAPTER IV.

CHOREA.

CHOREA, commonly termed St. Vitus's Dance, is a nervous affection, characterized by irregular or jerking movements, over which the animal has no control, and which continue more or less pronounced all the time, excepting when he is sleeping.

Much the largest proportion of the victims are puppies, or dogs that have but recently reached maturity.

There is much uncertainty as to the causes of this affection, but since it occurs so often after distemper, that disease must have a very decided causative influence. It is evidently also sometimes brought on by fright; and worms have been assigned as the cause, but whether rightly or not is not known. There appears reason for the belief that when the general health is impaired the liability of its occurrence is measurably increased.

It may be quite extensive and involve several parts of the body, but as a rule it is confined to one set of muscles, or the head or leg.

Chorea is one of the most obstinate affections which the owners of dogs are called upon to treat, and although it has been recovered from, the chances of a complete cure in any case are very small indeed.

The purpose of treatment should be first, to overcome if possible any existing derangements or impairments which may tend to aggravate the trouble, such as constipation, indigestion, worms, debility, etc., also to tone up the nervous system by means of a highly nutritious diet and other influences conducive to health if any such have been neglected.

Of the many different remedies recommended for chorea, strychnia and arsenic appear the most popular. In using the former more than ordinary skill is required, for it is not likely to have the desired action unless the doses are steadily increased until the physiological effects of the drug are reached. Or in other words, the strychnia must be pushed until symptoms of poisoning are threatened.

Obviously few non-professionals would care to go thus far, and if they did they might not stop at precisely the right point, therefore of the two remedies arsenic is the better for general use.

Fowler's solution is the preparation to be employed by the inexperienced; and for convenience it should be in slightly diluted form, as follows:

Fowler's solution, one-half an ounce ; water, one ounce and one-half.

Puppies can safely bear larger doses of this drug than mature dogs; and when over eight months of age for those of breeds of medium size, the commencing dose may be sixteen drops of the foregoing mixture; for the largest breeds, twenty-four drops; for fox terriers and the like, eight drops; and for toys, four drops.

This should be given three times daily, in the food; and the dose be increased one-fourth after every third day.

That is, puppies taking at first sixteen drops will, on the fourth day, take twenty drops, on the seventh day twenty-four drops, and so on. While for toys an increase of one-fourth will be one drop in every instance.

The mixture having been given thirteen days, and increased four times, it should be stopped for three days. Then the administration should be resumed, the commencing dose being the same as that being taken when the stop was made; which would be thirty-two drops were the patient of medium size.

The increase should again go on as before, and continue until four more increases have been made.

A pup of medium size will finally be taking forty-eight drops.

After this fourth increase, which is the eighth from the beginning, the largest dose having been administered for three days, there should be a second stop of three days, during which the mixture must be withheld.

That period of rest will be over on about the thirtieth day of treatment; and then the use of the medicine should be resumed, the commencing dose to be the same as that which was being given when the stop occurred.

Thereafter there must not be any further increase. Instead, there must be a decrease; and it should be in precisely the same ratio and manner as the increase. That is, the maximum dose should be given for three days, and then a decrease of one-fourth made, and so on. After four decreases there should be a halt of three days; and then should follow four more decreases; when the dose reached will be the same as at first; or sixteen drops for pup of medium size.

Following the eighth decrease, for certainly one more month, even if the twitching has stopped, the medicine should be given three times daily, the commencing and smallest quantity being the dose.

The twitching is not likely to cease before the largest dose is reached, if it does then, but even did the result of treatment prove so eminently satisfactory at any stage, the mixture should be persisted in as advised lest relapse occur. A return, however, should be made to the commencing dose. That is, in event the twitching ceases, further increase should stop at once, and thereafter the medicine be given for a month, the dose being the smallest, with which treatment commenced.

While puppies will safely bear large doses of arsenic, there are of course limits of toleration, and it is assumed that these are reached under this treatment

about the twelfth day ; hence the stops are recommended, that any ill effects of the drug may pass off before the administration is resumed.

If under this treatment the chorea is not cured, the same system might, in the course of two or three weeks, be employed the second time.

Given as advised, unpleasant or poisonous symptoms are not likely to follow the use of arsenic in large doses ; but if any appear, manifestly the medicine should be at once stopped.

The most notable of such symptoms is paralysis of the hind legs. Other indications of poisonous effects are, redness of the eyes, pallor of the lining of the mouth and covering of the tongue, stiffness in movements, tendency to spasms, gastro-intestinal irritation, with vomiting, pain and diarrhœa.

In some cases treatment by the sulphate of quinine promises rather better than any other ; the dose being two grains for a pup over eight months old and of medium size ; three grains if of largest breed ; one grain if about the size of fox terrier ; and one-half a grain if a toy.

These doses should be given three times daily for about three weeks, unless the twitching sooner yields, or symptoms of ill effects are manifested.

Quinine in such doses might lessen the hearing power, but it is not likely to do so.

The nitrate of silver has been strongly recommended by some, and it has even been claimed that it is a *specific* for chorea. Although it has acted well in occasional cases, to call it a specific or sure cure for the disease is going much too far.

Rightly used it can do no harm, and it is certainly worthy a trial in the worst cases. Granules of various strength can be obtained from druggists, and the proper doses are as follows : For the largest breeds, one-half a grain ; medium size, as setters and pointers, one-fourth of a grain ; fox terriers and the like, one-eighth of a grain ; toys, one-twelfth of a grain.

One granule should be given in the middle of the forenoon, and another in the middle of the afternoon ; and the use of the drug be persisted in for at least a month.

While it is being given it will generally be advisable to administer a tonic, for the purpose of sustaining or increasing the strength, and adding vigor to the nervous system. Pills composed as follows should therefore be obtained :

Sulphate of quinine, one drachm ; dried sulphate of iron, one drachm. To be made into sixty pills. One to be given morning and night, with the breakfast and supper.

These pills are right for medium size breeds. They should be one-half stronger for largest breeds ; one-half weaker for fox terriers and the like ; while only one-fourth as strong for toys.

Cimicifuga or black snake-root is considered by some an efficient remedy for chorea, but, like the iodide of potassium, which also has advocates, it would

likely be disappointing. However, there can be no objection to uniting it with the arsenical treatment; and indeed it may be well to give it a trial if one course of the arsenic mixture advised has been administered without good effect and a second round is contemplated.

The fluid extract is the best preparation of *cimicifuga*, and the dose for a pup over eight months old and of medium size breed is six drops; for largest breeds, nine drops; for fox terriers and the like, four drops; for toys, two drops.

Each dose can be given with a dose of the mixture of Fowler's solution and water, prepared as advised in the foregoing.

When chorea is associated with debility it will be well to combine the citrate of iron and ammonia, or the compound syrup of hypophosphites, with the arsenic given; and in such event the druggist can have the proportions right if informed that the dose for a pup of medium size breed is about the same as the minimum dose for an adult. The largest breeds can take one-half more; pups of about the size of fox terriers, one-half less; and one-fourth the dose would be right for toys.

Hemlock has been much used in chorea, and some think highly of it. Given alone it is not likely to have much effect, but in event the quinine treatment has been tried without good results it might be well to modify it somewhat and give it another trial after a week has elapsed.

The modification may be to combine with the sulphate of quinine precisely as many grains of the extract of hemlock and as many grains of ginger. For example, assuming the pup to be of medium size, two grains of quinine have been recommended for him. As modified, the dose would be the same quantity of quinine, two grains of the extract of hemlock, and two grains of ginger.

Each dose will therefore be six grains of the mixture, and made up of the three drugs, the quantity of each being the same — two grains.

The druggist should make pills of the right dose, or use gelatin capsules, each to contain one dose.

Modifications for the various breeds will be easy. Thus, one-half more for largest breeds; one-half less for fox terriers and the like; and one-fourth for toys.

That mistake may not be possible, the dose for the latter is given as follows:

One-half a grain of quinine, the same quantity of the extract of hemlock, and the same of ginger.

Hypodermic injections of *hyoscyamus* have had good effect in some cases, but manifestly this treatment must generally require the services of a physician. Could one be interested in a case and persuaded to administer a hypodermic injection daily, it would be well to give the treatment a trial, other methods having failed.

Instead of using *hyoscyamus*, the alkaloid of it, *hyoscine*, would be better. And better still, perhaps, the *hyoscine hydrobromate*.

Certain chemists manufacture a tablet in which the latter appears with the sulphate of morphia and sulphate of atrophia; and this combination promises well.

A tablet suitable for an adult would be right for a pup over eight months old and of medium size or large breed; while it should be cut in halves for fox terriers or the like, and quartered for toys.

The medicine should be thrown under the skin directly over the muscles that twitch.

As stated in the beginning, chorea is an extremely obstinate affection, and cures are unlikely to occur except in rare instances; but still, if the subject is valuable, an honest effort should be made for him.

NEURALGIA.

Neuralgia or nerve pain has been defined as the cry of a nerve for more or better blood.

Such pain occurring in any part of the body may originate in and be solely in consequence of some defect in a nerve there, but as a rule it is a symptom and expression of a general faulty condition, due to some impairment of the nervous system, and in most cases, but not all, to poverty of the blood.

An example of the former is face ache—*tic douloureux*—when produced by a decayed tooth. While hemicrania or neuralgic pain in one side of the head, when not due to disease of a tooth or inflammation of the cheek or jaw, is an illustration of the other form of neuralgia. This often has the character of “chills and fever,” comes and goes at intervals like that, and defies all other remedies except quinine, thus plainly showing that it is constitutional—not local—and due to a malarial taint in the system.

Many exciting causes, both local and constitutional, are recognized as active in producing neuralgia. The former by pressure or other influence applied directly to the nerve itself, the latter by morbid states of the blood, exposure to cold, disorders of digestion, debility, and many other derangements.

Neuralgia may appear in any organ or part of the body that is supplied with nerves of sensation.

The pain usually comes on suddenly. In severe cases it is excruciating, and forces the sufferer to howl piteously. He also acts strangely. Possibly he runs wildly about and appears as though “out of his head,” but as a rule he first, and for a time, clings as it were to his master or mistress, evidently hopeful of relief from friendly hand. But failing to obtain it, he is singularly inclined to slink away and conceal himself for hours, and perhaps days, in the barn or an out-of-the-way place, where he generally remains until the attack has passed off.

Nor does he come when called ; and if found, his manner indicates that he is resentful because something effectual has not been done to lessen his sufferings.

A difference in manner is generally the evidence first noted in a painful attack. This may not be very pronounced, and scarcely more than a restlessness, the animal lying down for a moment, then getting up and walking about his enclosure, and again down, but soon to return to his feet.

Once attention is attracted to him, by patient watching the pain can generally be located, and with certainty, because the parts as a rule are highly sensitive, and the sufferer shrinks and perhaps cries under pressure of the hand.

Manifestly, to bring relief as speedily as possible is the first object of treatment. Here the sympathetic master is confronted with the fact that he cannot rely on opiates as he could were he, himself, the sufferer, because they act very differently on dogs, and he might be destroyed by a dose that would not have any appreciable effect on his dog.

Local applications should first be faithfully tried, and consist of hot water, hot rum, or alcohol.

Strangely where these have failed, relief has been obtained in some cases by the application of ice.

When the affected nerve lays very near the surface, menthol will often quickly dull the pain. It should be in solution with alcohol, the proportion being menthol, one drachm ; alcohol, one ounce. With this the painful spot should be thoroughly wet, and then covered with a cloth to prevent evaporation.

The following liniment is quite a powerful anodyne :

Oil of cajuput, one ounce ; spirit of camphor, one ounce ; spirit of ammonia, six drachms ; alcohol, one ounce ; chloroform, one ounce.

The coat on the affected spot should be drenched with this, and covered with a dry flannel.

Another less expensive liniment, having the same effect and to be used likewise, is the following :

Chloral hydrate, one drachm ; soap liniment, four ounces.

The tincture of aconite is a powerful anodyne ; but it must be used with exceeding care. When the pain is limited to a small spot, this tincture may be rubbed into the skin by means of a little swab made of cotton.

An ointment composed of veratrine, ten grains, and lard, one ounce, when rubbed upon the skin over an affected nerve will often relieve pain in it in the course of ten minutes. Like aconite, however, it is a poison and must be used carefully.

As for opium and its products, one of them should be tried if all local measures have failed ; but still they are likely to prove disappointing. If morphine is used and the dog is of medium or large sized breed, the dose should be not less than one-quarter of a grain, and repeated every hour until relief is

obtained. One-eighth of a grain for dogs of size of fox terriers, and one-twelfth of a grain for toys, would be safe.

Neuralgia of intermittent form, and recurring every second or third day, requires large doses of quinine.

Nutritious diet, tonics, and wise management are of course demanded in cases of debility, or in which the blood is poor.

PARALYSIS.

Paralysis is a symptom or the expression of an abnormality somewhere in the nervous system, and characterized by impairment or loss of nerve force and ability of the muscles involved to act in response to command of the will. It may be partial or complete; it may also be confined to one or a few muscles, or affect many muscles, as all of a leg, or one-half of, or even the entire body.

Paralysis may be due to a defect in the brain or spinal cord, in the nerves branching therefrom, or in the muscles themselves.

Among the causes are included contusions, wounds, fractures, and other injuries produced traumatically, also diseases of parts in the region of the affected nerves which cause compression, as in the case of tumors and enlarged glands.

Diseases of the brain and spinal cord are among the most frequent causes. It is the inevitable result of plugging an important artery in the former by a clot formed in the heart, the supply of blood from a portion of it being thus cut off.

Certain poisons are capable of producing paralysis. In some instances also it occurs after acute diseases, notably distemper; and it may result from severe exhaustion of the nervous system.

Puppies especially often suffer from the so-called reflex paralysis, which is the consequence of some disease, injury, or irritation at the points of nerve distribution, as in worms, constipation, and other intestinal disorders, affections of the kidneys, bladders, etc. And this form of paralysis is commonly exhibited by impairment or complete loss of power in the hind legs.

If the paralysis is partial it is shown by a trembling, feebleness, and uncertainty of the movements of the parts involved. When it is complete the muscles are commonly relaxed and incapable of the slightest resistance.

In spinal paralysis both sides are commonly affected; but when the brain is the seat of the trouble, loss of power almost always occurs on one side of the head or body, and that opposite to the injury. When the affection is reflex, the impairment or loss is limited to the region supplied by one or a few nerve trunks.

Paralysis may come on suddenly or gradually. After existing for a time the affected muscles lose their contractibility, and waste, and the power of motion in

them is ultimately permanently destroyed; or the affected nerves may become incapable of conducting impressions, and thus recovery be no longer possible.

Lameness in one or both the hind legs without known injury, or partial or complete paralysis of them would justify the suspicion of worms, and the application of appropriate treatment; and when the diagnosis is right, as a rule improvement at once follows their expulsion.

In other cases of paralysis occurring suddenly, the first step should be to free the bowels by means of an active purge. Then the condition of the bladder should be determined by watching; and if paralyzed, and the animal unable to void his urine, he must be relieved by means of a catheter.

Where the cause of paralysis can be determined, manifestly it should be removed if possible. If occasioned by pressure, the same must be relieved; or if by a poison, the proper antidote is in order.

Paralysis following distemper or other acute disease may not at once require any special medicinal treatment. If by the means of careful nursing, generous and nutritious diet and tonics, the general health is built up, some improvement in the paralysis may occur in the course of two or three weeks; but if not, a nerve stimulant must be given. In the meantime the paralyzed parts should be manipulated and hand-rubbed for at least ten minutes daily, to maintain the integrity of the affected muscles, that they may be able to respond to the nerve current and force when it is again turned on.

Electricity would be of great benefit in most cases, but its application to the dog is attended with so many difficulties it can never be a popular remedy.

The beneficial effect of hand-rubbing may be increased somewhat by a stimulating liniment; and in cases in which the paralysis has existed several weeks, small fly-blisters will likely be of value.

Where the loss of power is only partial, rest for the first two weeks should be enforced, but after that, daily efforts to move about should be encouraged.

The medicinal agent to be depended upon as a nerve stimulant is strychnia.

From druggists may be obtained granules containing various amounts of the sulphate of strychnia, — from one two-hundredths up to one-twentieth of a grain, — therefore the doses can be easily adjusted; and the granules being of uniform strength, the use of this powerful agent ought to be perfectly safe.

As the doses are to be increased every sixth day, the purchases should be limited to twelve granules; one to be given twice daily, with the breakfast and supper.

The commencing dose for pups over six months old and of medium or large size breeds is one-sixtieth; if about the size of fox terriers, one one-hundredth; for toys, one two-hundredths of a grain.

The second lot of twelve granules should contain about one-twentieth of a grain more strychnia. That is, the granules right for medium and large size breeds would be one-fortieth of a grain; for fox terriers and the like, one-

eightieth; and for toys, one one-hundred and eightieth. While in preparing the third lot a similar increase should be made.

As a rule, three such increases are perfectly safe. If, however, at any time the physiological effects of the drug are noted, — as stiffening of the legs, — its use should be at once stopped.

Strychnia having failed, simple borax should be given a trial, in the following doses: largest breeds, six grains; medium size, four grains; fox terriers and the like, two grains; toys, one grain.

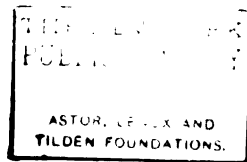
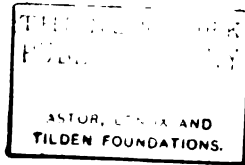
This medicine should be in the form of powders, one of which should be given three times daily at first, but in the course of a week the dose should be doubled.



INTESTINAL COLIC.



RICKETS.



SECTION IX.

AFFECTIONS OF THE BONES AND JOINTS.

CHAPTER I.

RICKETS.

RICKETS is a constitutional disease of puppyhood, characterized by general debility and defects of nutrition, chiefly in the bones and cartilages, but also in the muscles and other anatomic structures, causing imperfect development of the bones and consequent deformities.

Debilitated or rachitic sire or dam may transmit a taint to the offspring; or rickets may arise from improper feeding or insufficient food, and other faults of management, which include a deprivation of sunlight and pure air, uncleanness and exposure to noxious emanations, dampness, etc. In some instances it is developed rapidly after other diseases, which have left the system in a state of debility.

It has generally been accepted that this disease is either due to a deficiency of lime in the food or to imperfect absorption of lime salts, in consequence of stomach or intestinal disturbances. Beyond doubt there are forms of diet which predispose to it; and they do so chiefly because they are either defective in some ways or do not supply in adequate proportion certain very essential elements.

When the mother's milk is poor in quality as the result of previous ill health, insufficient nourishment or unsuitable food, her pups are very likely to suffer from rickets in consequence, particularly if they are of large breeds. A lack of a goodly proportion of meat and an excessive amount of farinaceous foods greatly favor the occurrence of the disease, the latter especially, through the fermentative process set up by the starch, and thereby the production of lactic acid; which is believed to be an active agent in the causation of rickets, it being supposed to form a soluble salt by union with the lime of the bones, and thus remove it from the system.

Another popular theory is, that this disease is very liable to be developed when the system is deprived of an adequate amount of fat. In support of this there is considerable experimental proof; and it certainly is easily accepted in light of the fact that the happiest results follow the judicious use of oil in treating rachitic patients.

Doubtless the foundation of rickets is often laid during the nursing period; yet many pups that were perfectly healthy when weaned have afterward broken down with it because of having been improperly fed.

The onset of the disease is slow. Although the first rachitic changes usually occur in the bones of the head and ribs, the presence of it is not likely to be detected until the forelegs are affected. The striking alterations there are a thickening of both their ends, and bending of the long bones; which deformity is due to softness of the bones, and their yielding under the weight of the body.

Soon the ligaments of the knee-joints are stretched and the victim walks on his pasterns. In consequence he appears down by the head, his hips being considerably higher than his foreshoulders. His gait is then peculiar, unsteady and very awkward. At the same time similar changes are going on behind, the deformity being especially pronounced in the hocks, while his legs are badly twisted. It is now impossible for him to run, and his attempts to do so are a series of short, lumbering jumps.

Marked changes have also been occurring in the head and body. The former has lengthened; it is flat and presents prominent angularities, while owing to alterations in the ribs the so-called chicken-breast has formed.

On an all-around view the poor dog is a most unsightly object, while his rough and staring coat, pallid gums and lips, flabby muscles, etc., give unmistakable evidence of ill health.

That animals used for breeding purposes should be of as high health as possible, is a self-evident truth.

As pups of the largest breeds are the easiest victims of rickets, it is advisable always to use some measure of prevention with their dams, since it can do no harm, and may do great good. To them should be given the precipitated phosphate of lime during the whelping period. This is a product of bone, and a most efficient bone-producer and hardener; also an active agent in nutrition. It is a white powder, odorless and tasteless. It should be administered once daily in the food during the first month of gestation, and twice daily thereafter until the pups have been weaned. An ordinary dose for the largest breeds is an *even* teaspoonful, but this can be safely and wisely increased during the last month before whelping if the litter promises to be large; in which event the demand upon the mother for bone material must be unusually great.

The precipitated phosphate of lime may also be given to pups that exhibit signs of rickets, and the dose for medium size or largest breeds may be about ten grains, twice daily in the food; six grains for fox terriers and the like, and four grains for toys. When milk is fed it will be a wise plan to add to it the common lime-water of drug shops, in the proportion of about one-fourth. The diet, however, should consist as largely of meat as can be well borne.

Cod-liver oil is of the highest value in this disease; and it can be given at the same time the phosphate of lime is being taken. The dose is from one

teaspoonful to one tablespoonful, two or three times daily, a decrease being necessary if the bowels become too loose.

If it seems advisable to stop the cod-liver oil for a time, the beef, iron and wine may be properly given instead.

Pure fresh air, ample sunlight, and dry, well ventilated quarters are imperative. Indeed every helpful influence to be gained by good management should be brought to bear during the treatment.

Marked deformities are not likely to be entirely obliterated, yet under good treatment the improvement is often surprising.

DISLOCATIONS.

Of dislocations and fractures the reader should have some knowledge; not that he be encouraged to undertake their treatment, but that he may be at least led to strongly suspect, if not detect with certainty, such accidents when they occur.

A bone is said to be dislocated when it is "out of joint." To be a trifle more explicit, a dislocation is the displacement of one bone from another at its place of natural connection. When entirely displaced the dislocation is called "complete;" when not so, "partial" or "incomplete." It is called "compound" when with the dislocation there is an open wound that communicates with the affected joint; and "complicated" when there is a fracture of bone or laceration of a blood-vessel in addition to the dislocation.

Dogs but rarely suffer from dislocations; and when so unfortunate, the accidents are generally the results of falling or jumping from considerable heights, being run over, having a foot caught and hung by the same when attempting to jump fences, or of kicks or blows.

The ends of bones are closely covered by cartilage or, as commonly called, "gristle," which furnishes smooth bearings for the connecting bones, while they are held together by a very tough tissue, termed ligament, which envelops them completely like a tight bag. This bag is called a capsule, and is lined by a delicate membrane known as the synovial membrane, which secretes a fluid that lubricates the joint, and is called the joint-water or synovial fluid. This capsule alone is not sufficient to hold the bones together, hence it is fortified or strengthened by short bands or ligaments constructed of similar substance, which extend from one bone to its connecting bone, and cover the capsule. Aside from these attachments there are other ligaments within the capsules of certain joints which connect the ends of the bones directly with each other.

In all dislocations but of the lower jaw the capsule described splits to allow the dislocated end of the bone to escape; while the short ligaments, tendons, and muscles which cover the joint are more or less injured. Fortunately, how-

ever, all these structures very readily unite and heal after the dislocated bones are returned to place, unless the dislocation be compound or complicated. While if a dislocation is not reduced, or, in other words, the displaced bone is not put back or set, Nature always endeavors to compensate for the injury by furnishing another socket for the displaced head of the bone in its new situation, also new ligaments; and meanwhile the old socket fills up. Thus, thanks to her benevolence, a bone may be dislocated and neglected, yet a very useful joint be furnished in time; and where such injury has occurred in puppyhood and been left to itself, not having been detected, in not a few instances the adjustments were so perfect the dogs were as strong and active as ever on their legs and free from any notable sign of deformity or lameness.

One radical difference between a dislocation and a fracture is that where the former occurs the affected leg is but slightly if at all movable by efforts of the victim, whereas in the latter the condition is directly opposite, and the leg can be moved about even more freely than would be possible were the bone not broken. A dislocated leg is usually stiffly fixed in its unnatural position, and any attempt to move it causes intense pain; moreover, during such attempt, there is not heard that grating sound which is plain when the ends of a broken bone are moved over each other.

An evidence of dislocation that can scarcely escape detection is more or less deformity of the parts, which appears when the uninjured is compared with the injured member. With the dog placed in proper position it will be readily seen that the dislocated bone is longer or shorter than the like bone on the opposite side. Another fact to be remembered is, that if a dislocated bone be drawn back into its proper place any existing enlargement or deformity will disappear; while if a broken bone be treated in the same manner the deformity will disappear, but invariably reappear as soon as the leg is released by the hands and allowed to slip back to its unnatural position. Pain and swelling are present in both dislocations and fractures, but as a rule they are more severe in the former than in the latter.

The setting of a broken bone may be delayed for some hours without harm resulting, but a dislocation ought to be reduced at once; and the sooner it is undertaken the easier that operation. Again, if the attempt at reduction is made immediately after the accident, rarely will ether be required, whereas it must generally be administered where there has been any delay.

He who would reduce a dislocated bone should be not only intelligent and of "good nerve," but have some knowledge of the structure of the affected joint. A person so endowed ought to find the essential operation easy provided he undertakes it within a few minutes of the accident, but if the bone has been out of place any considerable length of time he should seek the assistance of a professional.

Dislocation of the lower jaw sometimes occurs, but only rarely unless that

bone has been fractured. Diagnosis of this accident is easily made. If both sides are out of joint the lower jaw projects much beyond the upper, and the mouth is wide open and cannot be closed unless great violence is exhibited. If only one side is out, the tip of the jaw is turned obliquely, usually towards the unaffected side. Whereas in fracture of that bone the tip is toward the injured side. When it is dislocated a depression can always be felt at the place of the joint, while in front of it there is a hard bunch. With the mouth wide open there is constant drooling; the tongue soon becomes purplish; the eyes are forced into unusual prominence—they bulge as it were; there is great pain; and the poor dog is constantly on the move.

This dislocation can be reduced in two ways. The first, which is the simplest, is sure to be successful with most of the small breeds, and ought to be equally so with the largest. The operator should bandage both thumbs with napkins; or possibly very thick gloves may afford sufficient protection. The dog being firmly held by assistants, he should stand or kneel in front of him and introduce his thumbs, one on each side of the jaw, until they rest upon the last lower teeth. Steady pressure must then be made upon the teeth downward and backward, while the tip of the jaw is slightly lifted with the little and ring fingers. By this means the heads of the bone are lowered; and when sufficiently low they slide back into place. The jaws then snap together with considerable force, the irritated muscles contracting firmly, hence the importance of protecting the thumbs with several folds of linen or thick buckskin gloves.

The other method of reduction is for the operator to sit or kneel on the floor with the dog's head between his legs. A couple of corks or pieces of soft wood, or even a single piece, are placed upon the last lower teeth, one on each side if two are used, then with one hand over the upper jaw and the other grasping the tip of the lower, the latter should be drawn steadily upward, the cork or wood acting as a fulcrum; and the bone should soon slip into place.

Dislocation of the jaw of a dog is so difficult, after it has once occurred there is scarcely any danger of recurrence without severe injury being inflicted; therefore it would not be necessary to apply after-treatment by muzzling, as writers are accustomed to advise.

Dislocation of the elbow is less rare than like injury of the lower jaw. Great force is required to produce it, and extensive laceration of the ligaments is inevitable. It is usually caused by a direct blow upon the elbow or an indirect one on the foot, by a fall from a great height, or sudden and severe twist. This joint is complicated, and several displacements may occur which can scarcely be understood without a fair knowledge of its structure; yet unless several hours have elapsed since it happened, and there is consequently much swelling, a displacement ought to be easily made out; the leg being kept flexed and the joint immovable.

A reduction of the dislocation is readily effected and without much difficulty.

With the lower leg pulled downward and crossed on the opposite leg, and held firmly with the left hand, with the right the elbow-joint should be grasped, and by means of the fingers pressing against the head of the displaced bone, the effort should be made to force it back into place.

In consequence of rupture of a highly important ligament, as soon as the dislocated bone is in place and the dog allowed to bear weight upon his foot, it will generally slip out of place again. For this reason the after-treatment is very exacting. The bones must be kept in natural position by means of a tight bandage, or one made of starch be applied.

The stifle-joint corresponds to the knee-joint of man, and like the latter is provided with a knee-cap known as the patella. This may be dislocated on either side, but the dislocation is usually on the inner side; and such accident is especially liable to occur where the joint is weak and the ligaments are relaxed and wanting in tone. In high jumping, also, the conditions are favorable for it; hence greyhounds are among its most frequent victims, although other delicately constructed dogs are now and then included, and even toy terriers and like small breeds are by no means exempt from it.

Dislocation of the patella is attended by sharp and very severe pain. When it is inward, the victim holds his leg bent nearly as much as possible, and the hock and heel are turned outward. On examination of the joint the patella may be found lying sideways, and movable from side to side. If an effort to straighten or still further flex or bend the leg is made there is a howl of pain, and the most vigorous efforts to escape are excited.

In order to reduce the dislocation or return the patella to its bed, the leg must be drawn backward and straightened as much as possible; then the displaced bone, being firmly grasped with the fingers, can be forced back to its normal position.

If undertaken at once after the accident the operation is easy, but when delayed and inflammation has set in, it is oftentimes quite difficult. In the first instance usually the dog immediately walks away without exhibiting any trace of the dislocation. The rule, however, is, that after one such experience, for quite a long time similar accidents are specially liable to occur; therefore a dog that has suffered from it should be kept under restraint for awhile and not allowed to run or attempt high jumps.

After several dislocations and reductions the victim generally realizes his weakness and favors the affected leg, often running on three legs; and in walking he exhibits very decided lameness. He must then be kept quiet for several weeks and have massage faithfully applied to his joint, to tone up the parts and overcome the existing tendency to dislocation. Material benefit may also be expected from the use of an adjustment by means of which the affected leg can be carried in a sling, and kept up close to the abdomen.

In instances in which dislocation of the patella occurred long ago and the

true nature of the accident escaped recognition — consequently it remained out of place — the chances are all that the disability will be permanent.

A joint disabled by a dislocated patella soon becomes inflamed, and the swelling that results is largely permanent unless the bone is returned to place. If the inflammation be severe and of long standing, the ends of the bones in time become enlarged. The joint is quite stiff, and the leg not being used, its muscular tissues waste, until it is but little if any more than half its original size. Another natural consequence is noted in the general appearance of the dog. Unable to exercise freely and harassed and dispirited by pain and soreness, he falls out of condition. He is disinclined to exert himself; and when moving about does so with difficulty; his back is arched; his abdomen "tucked up"; and, all in all, he is an unsightly object.

While recovery is out of the question in such cases, more or less improvement generally occurs; and possibly before a year has elapsed the joint has limbered up some, and the unfortunate is able to bear a little weight on his foot. Gradually, but very slowly, he gains, and may in the course of six months be able to walk short distances fairly well; but beyond that, in the way of improvement, he is not likely to go far.

External dislocation of the patella is very rare. Where it has occurred and the bone not been restored, aside from the ankle-joint being much bent and the tarsus thickened and uneven, the changes in the affected leg are about the same as those which result from permanent displacement internally.

CHAPTER II.

FRACTURES.

THE composition of bones varies somewhat at different periods of life and in disease. For instance, during early life they contain proportionately more animal or soft matter than mineral or hard matter, consequently the bones of puppies bend easily and seldom break. In old age there is a decided excess of mineral matter; there has been, also, a slight but steady absorption and reduction in the size of bones, therefore the liability of fracture is then much greater. Again, there is a difference in the disposition to unite and heal readily, and after middle life the process is slower than in previous years; while in very old dogs there is marked reluctance to repair fractures.

Rickets is the best illustration of the variability of the composition of bones in disease. While that exists they are weak, yielding, and easily broken.

Bones of dogs are generally broken by direct violence, the force being applied directly at the point of the fracture, as a blow, from a fall, or the passage of a wagon-wheel over a leg. Less often fractures result from indirect violence, the force being applied at one part of the body, breaking a bone in another part, as a fall on the forefoot which breaks one of the upper bones of the leg. In very rare instances, also, small portions of bones have been broken off by what seemed enormous muscular strain, as required in making long or very high jumps.

Fractures may be "complete" or "incomplete." In the latter the bone may be cracked or splintered lengthwise, or bent or broken only half way through. A complete fracture extends entirely through the bone. A fracture is said to be "comminuted" when the bone is cracked or broken into several pieces. In an "impacted fracture" the same force that produced it drove one piece of bone into the other—in other words telescoped it and fixed it firmly. In a so-called "simple fracture" there is no open wound; but in a "compound fracture" a wound is made by either the same hard body that produced the fracture or by the ends of the bones forcing their way outward through the skin. A fracture may be simple or compound, and at the same time "complicated" if there is with it serious injury to other parts than the bone; as for instance, when it opens into a joint, ruptures a large artery, lacerates or severs important nerves, or injures internal organs.

The pronounced signs of fracture are pain, swelling, loss of power in the

leg, change in the outward appearance of the injured parts, ability to move portions of the leg below the injury in ways and directions which would not be possible were it uninjured, and a low grating sound, called crepitus, to be heard near the broken ends of the bone when they are twisted or rubbed over each other.

In other words, one may be reasonably certain that a bone is broken when its shape is changed, pain is caused by every movement, and a crackling sound is heard or a crackling felt by the examiner as he moves the parts. A broken bone is generally shortened; the muscles above and below the place of fracture drawing the two pieces so as to overlap each other. When the break is near a joint it is sometimes difficult to determine whether there is a fracture or a dislocation; and the difficulty is much increased if the examination is not made until several hours after the accident and inflammation has set in, attended by swelling.

While it is sound, a leg is sure to be like its fellow on the opposite side.

If after an accident there is a change in the shape of a leg there must be either a dislocation or a fracture; and to distinguish between the two should rarely be difficult. To produce the grating or crepitus, grasp the parts above and below the injury and gently endeavor to rub the ends of the bone together, or slightly twist the lower part.

A fracture may be mistaken for a severe bruise, or for a sprain, as well as for a dislocation. If the injured dog is not examined until several hours after his accident and there is much swelling and inflammation, it may be that to at once determine the nature of the injury will not be possible, nor until after applications of hot or cold water have been made to reduce the swelling.

In a simple bruise there is merely pain and swelling, and possibly some loss of power in the leg, with slight changes in its appearance. But there is no unnatural motion below the point of injury, and no grating sound, as between the two ends of a broken bone. A sprain also lacks these last signs. As for the means of discriminating between a fracture and a dislocation, they have been already described.

As a rule, broken bones will unite if their ends are brought together and kept in place. In very rare instances, however, they fail to do so and a so-called false joint is formed; the bones are either not united at all and easily movable on each other, or they are held together more or less firmly by cartilage or ligaments. Sometimes also the false joint very closely resembles a true joint.

If broken bones are not properly set or kept in place there is deformity. They may unite at an angle, making a crooked leg; or if there is destruction of a portion of a bone or overlapping of its fragments, the leg is shortened. Joints may also be rendered stiff by fractures which are near but do not enter them.

In the treatment of fractured bones the first two essentials are to get the broken parts into their right places and keep them there until they unite or

"knit together." The union takes place by a natural process of growth, like that by which a wound is healed on the surface of the body. A thick colorless fluid — plastic lymph — is poured out around and between the ends of the broken bone. Gradually it changes to cartilage or "gristle," and that eventually becomes solid bone.

In "setting" a broken bone it is in most instances necessary to pull or stretch the leg, to overcome the shortening action of the muscles. At the same time, by proper manipulation and pressure over them, the fragments are to be adjusted. This done, means are required to keep the parts in place, and splints, bandages, etc., must be used.

Although the pain caused by the operation may not be sufficiently intense to call for it, ether may be required because of the muscular resistance or struggles of the patient, and if so it should be administered. No unprofessional person should attempt, if avoidable, the treatment of a fracture without the aid of a surgeon or duly qualified veterinary. It may happen, however, that at the time of the accident professional assistance cannot be obtained. It is therefore desirable, besides the foregoing considerations, that something be here said of the general requirements when fractures have occurred.

Ordinary bandages cannot be applied to dogs with any reasonable hope of their remaining tight and in place, therefore, as a rule, the dressing must be of starch or plaster-of-Paris. In cases in which there is much swelling, or likely to be much, these dressings cannot, however, be used at first, and a splint must be temporarily adjusted. Splints of wood are generally out of the question, because of the difficulty of adapting them, and they must generally be of a material that can be easily bent and fashioned. Thin sheet-lead may do, but pasteboard is more serviceable. That should first be cut about the right shape and allowed to stand in water until it has begun to soften. It should then be limbered up a bit by being bent in various directions with the hands, then placed over the fracture after the bones have been restored to proper place; and finally be covered by compresses of cotton or linen. Even better splints can be made from a sheet of gutta-percha or wire gauze, but they are rarely easily and quickly obtainable.

As soon as the swelling has sufficiently subsided the temporary dressing should be displaced by one to be permanent; and this had best be of plaster-of-Paris. Such a bandage might be applied directly after the injury but for the fact that dogs are so excitable and restless inflammation attended with much swelling is sure to be set up; in which event, of course, the bandage must be loosened; and that would be a very difficult matter were it made of plaster.

A dressing of plaster may be constructed as follows:—

Of old and thin cotton cloth, linen or cheese-cloth, cut bandages about two inches wide and two or three yards long. Extend each strip on a table or a board, and on it, throughout its entire length, sprinkle powdered plaster-of-Paris. The layer of the powder should be of about the same thickness as the back of

a common table-knife. Roll the bandage as tightly as possible, being careful not to shake off in the operation much of the powder. Prepare as many such bandages as will be required and have them at hand, together with a shallow basin containing water to the depth of a trifle over an inch.

After applying vaselin, sweet oil or lard to the hair on the parts to be bandaged, cover those parts with a few thin sheets of cotton wadding or a soft napkin. Now stand a bandage in the water, and after wetting one end, reverse it and wet the other. Securing the free end by pressure of the thumb of the left hand, unroll the bandage slowly and carefully, and while doing so perfectly adjust it to the leg. Having put on one bandage, wet another and apply it; and so on. Four or five thicknesses of the bandages will doubtless be required in making a good firm dressing. At each turn of a bandage it should be made to overlap about one-half of the previous turn. Care must be taken not to have the dressing too tight nor too loose. After the bandages are all on, wet the outside of them well and sprinkle over freely the powdered plaster; and then, without any delay, after dipping the hand in water, pass it over the dressing, wetting the powder and laying it down smoothly. This done several times, the dressing will not only be substantial but slightly as well. It will dry in two or three minutes if a little salt be added to the water used; and meanwhile the parts covered must be kept perfectly motionless. The dog will be quite sure to gnaw the dressing, therefore must thereafter be constantly watched or some protective adjustment be resorted to. Quite the best device is a circular piece of sole leather with a hole in its centre sufficiently large to admit the neck of the patient, and a cut between this hole and the outer edge, that it may be passed over his head. The sides of this cut can be laced or kept together by means of a strap with a buckle. A similar adjustment is used on horses to prevent their resting one foot on the other.

To remove such a bandage is tedious work if the plaster-of-Paris is not softened by a free use of vinegar. This done, it can be cut quite easily with knife or scissors. Another method which has been cordially recommended is to use a strong solution of bichloride of mercury; simply moistening the bandage along the line to be cut.

A starch dressing is made by soaking the bandages in starch prepared as for the laundry. Several thicknesses of them are to be applied evenly and firmly, and thereafter the leg be kept in splints until they are dry.

Whether the bandages are of starch or plaster they should be started at the foot and nicely applied to the entire leg, the pressure throughout being equal, otherwise swelling will result.

Compound fractures or others over which the skin is badly bruised or lacerated, also some peculiar breaks, require much more complicated treatment, which however, it is not necessary to discuss herein.

A permanent dressing should be kept in place about five weeks if possible.

SPRAINS.

In accidents termed sprains very generally joints are injured, and simply wrenched or twisted, or there is momentary displacement, the ligaments or bands which hold the bones in position being stretched, or they may be partially or completely broken or torn.

In cases of great severity, in which there is more or less extensive rupture of the ligaments, there at once occurs a sudden swelling and discoloration, which result from the pouring out of blood from the torn vessels into the tissues under the skin. Then follow more or less inflammation and lameness, which persist until the ruptured parts have healed; and this they do only very slowly, because the fibrous tissues of which the ligaments are constructed have only a low grade of vitality and not much blood is allowed them for nourishment. In consequence of the process of repair being so slow there is much truth in the old saying that oftentimes a bad sprain is worse than a fracture.

Sprains are commonly the results of distortions of joints; they being over-bent or bent in a direction not provided for in the mechanical arrangement of their parts. The violence done to them of course may vary almost infinitely — from that which gives only a momentary twinge of pain and causes but a slight limp for a short time, to that which is followed by much suffering and complete disability of the leg affected.

The signs of serious injury are pronounced and plainly suggest either a sprain or a fracture. The leg is carried, the foot not being allowed to touch the ground; while extreme sensitiveness is displayed if any attempt at examination be made. A sprain of the hock, knee, or pastern is attended with noticeable swelling in severe cases, but it is scarcely ever prominent where the largest joints are injured.

The belief has been quite prevalent that absolute rest of the parts involved is the most valuable means of repairing a sprain, and it doubtless is so in some cases; but certainly not in all. If the injury will permit of the foot touching the ground and some weight being borne by the affected leg, as a rule recovery will take place more quickly if moderate use is allowed than if rest were enforced. And since to distinguish between the two classes of cases is never easy, a dog suffering from sprain can best be left at liberty to move about as he pleases.

Of external remedies, water as hot as can be borne in comfort is the best; and this should be applied for an hour at a time if possible, and at least twice daily. During the treatment the patient should be stood in a bathing- or washing-tub and the parts drenched by means of a small basin or sponge. When a joint can be moved by the attendant without causing the patient to cry out or forcibly resist his touch, it may be accepted that it is no longer much inflamed, and that motion is not only admissible but will be beneficial. Massage may then be applied, and with dry hands or stimulating liniments, to overcome the remaining stiffness and restore the normal suppleness of the joint.

CHAPTER III.

LAMENESS.

Dogs are frequently more or less crippled temporarily, and by a variety of causes. The different forms of lameness closely resemble one another; and the treatment required in many instances is much the same. For these reasons to consider them individually and devote to each a separate section seems unnecessary; therefore under this heading the most important will be included in a brief and general discussion.

In one of the most common forms of lameness the exciting trouble is located in the stifle-joint; and it may be due to a wrench or sprain and stretching of the ligaments, or to an inflammation induced by a blow or kick, a run-over by a heavy carriage, or other direct injury. It is now and then at least partially attributable to a weakness of the joint induced by over-weight bodies; and cases of that class are furnished mainly by members of the largest breeds that are denied as much exercise as they ought to have, but still are fed generously. In these cases also usually the foundation of the lameness is laid in puppyhood, during which the cardinal quality to be attained by breeders is size; and with a latent weakness existing in that joint, a twist, wrench, even a slip while running, or a knock-over in play, may be productive of obstinate if not incurable lameness.

Much has been written on stifle-joint lameness. That joint is not naturally very strong, and it is quite complicated, consequently might be easily disabled. But notwithstanding this, also the fact that there are various influences which are capable of crippling it, it is only reasonable to assume that in the most of the cases of lameness the real cause is dislocation of the patella.

Such accident occurring and detected, the remedy is easy. If, however, the trouble is not discovered, destructive changes are allowed to occur in the joint, and to return the bone to its place is no longer possible, treatment can scarcely be encouraged, for the victim is permanently deformed.

This form of lameness, as a rule, comes on quite suddenly. If the victim is laid on the unaffected side and the foot of the injured leg drawn forward, the pain induced is intense; while firm and deep pressure over the joint is also very painful. When standing, if not interfered with, he assumes a position which is quite characteristic of stifle-joint lameness, namely, his injured leg

is behind the sound one, the toe of the former just touching the ground; from which however he is constantly raising it, but only slightly, evidently in consequence of pain. Manifestly this is greatly intensified when he attempts to move about, which he does stiffly and with exceeding difficulty, his back being arched and all the upper muscles of the affected leg tense and hard.

Ere long the injured joint is noticeably enlarged, much of the swelling being on the inner side. It grows stiffer and stiffer, and movements of it more and more painful. While, the result of being disused, the muscles of the leg waste steadily, and eventually it is much smaller than the sound one.

If left to himself, without proper treatment, nearly a year may pass before a dog so crippled exhibits marked signs of improvement and he is able to get about fairly well. But even then the affected parts are very weak, and he has only to exert himself a little to be quite as lame as ever. If, however, he does not have any serious drawback, the chances are that in the course of another six months he will have made very decided gain and be able to move around quite easily; but he will be a cripple always, and, the joint permanently stiff, he will carry his leg as though it were made of wood. Moreover, it being much bent and the joint abnormally large, he must be an unsightly object; and even more pitiable if the opposite leg, as is sometimes the case, be drawn out of shape by Nature's effort to compensate and adjust this to the leg deformed in consequence of the injury.

In every instance of stifle lameness the first step to be taken is to determine positively whether or not there is dislocation of the patella. Satisfied that that bone is in place, the dog should be put into quarters by himself. They should be small, and if a pen, the walls should be open so that he can look out even while lying down. They should also be at a distance from other dogs, and free from all disturbing influences. Here he should remain until all signs of inflammation have disappeared from the affected joint.

If he is full-blooded, he ought to have a purgative occasionally; and be kept on a diet of milk, rice, gruels, and other bland foods. At first the inflammation of the joint should have the same treatment as a sprain — frequent and long-continued applications of hot water. After a week or ten days there may be applied twice daily a liniment made of equal parts of the oil of origanum, spirit of ammonia, tincture of opium and olive-oil. This acts exceedingly well in all cases of joint trouble characterized by chronic stiffness and soreness. It is very strong, however, and should be used cautiously. The friction with which it is employed should be gentle; and care be taken that it does not get into the eyes or onto the lips, nor where the skin is scratched. It will also be well to cover with dry flannel the parts to which it has been applied. It may raise blisters, and if so, of course should be discontinued until they have healed.

Having used this for several weeks, if the swelling of the joint is not much less than at first and slowly disappearing, the liniment should be discontinued

and the swollen parts painted daily with the tincture of iodine, several coats of the same being put on at every sitting. This may be persisted in for a month or more, being stopped for a short time now and then if the skin becomes too much irritated. That it be kept slightly irritated, however, is desirable, drawing as it will then the inflammation from within the joint.

In severe cases of stifle-joint lameness it will usually be necessary to maintain as near absolute rest as possible for two or three months. If then the inflammation has not disappeared from the joint, the period of rest must be prolonged until it is out. That having ended, walking exercise may be allowed; but it must be gentle and nicely adjusted for several weeks, otherwise the joint may be again inflamed.

The so-called kennel lameness is wrongly attributed to close confinement and deprivation of exercise, for its real cause is rheumatism. In all cases, on thorough investigation, the fact must be uncovered that either their quarters are not healthy, but, instead, are draughty or damp, or the victims are mismanaged after having been worked hard, and allowed to become chilled.

No dogs are exempt from this affection, and, strangely, considering the prevalent delusion as to its cause, sporting dogs are the most frequent sufferers; which is not surprising since often they are afield all day, and instead of being rubbed dry and carefully housed at night, are left to "shift for themselves."

When kennel lameness is coming on the dog is disinclined to make exertion, and keeps much to his kennel and bench. He gets up with evident reluctance and some difficulty, and walks about stiffly for a time, when he seems to limber up a bit. If lifted or an attempt to examine him be made, he shrinks or cries out. Ere long there is a decided change in demeanor, and the bright, active and willing dog usually becomes notably dull, sluggish, irritable, and sullen. A morbid appetite is another common manifestation in this trouble. The peculiarity of often emitting short and sharp half-hows and half-barks is also frequently observed.

This "kennel lameness," when detected early and rightly treated, very generally speedily disappears. The first step demanded is to remove the patient from his usual quarters — which, by the way, may be faulty notwithstanding no defect can be discovered — and put him into others that are above suspicion. In his new place he should be accessible to sunlight much of the day, and kept warm and free from dampness and draughts. As for medicinal treatment and other essentials in the way of management, they are to be found, fully described, under the head of Rheumatism.

Foot-soreness is quite a common cause of lameness, especially among sporting dogs, and it can properly be herein included with other forms. The trouble manifests a decided preference for old dogs, although the young are by no means exempt.

Under ordinary conditions the thick and hard covering of the pad of a dog's

foot is reproduced with sufficient rapidity to fully replace that which is worn off. The hunting season over and a dog laid up, as it were, for a time that reproduction is much less active; but the wear becoming great again the process of renewal is quickened to meet the changed conditions. There are limits, however, and it is possible for the loss by wear to be decidedly in excess of the new supply. Hence if a dog is taken from his kennels and put afield very early in the season, and made to do fast and hard work before he has been properly brought up to it by moderate work or exercise, and his pads, which have softened during his lay off, have become toughened, firm, and hard, there is certainly a liability of his wearing through the covering, exposing the sensitive portion of the foot, and in consequence suffering from lameness.

Foot-soreness is easily made out on examination; and the essential treatment is very simple. The foot must be first soaked well in tepid water, and afterward thoroughly cleaned. It should then be covered with absorbent cotton, and inclosed in a small cloth bag. A solution of the chloride of zinc — two grains, to water one ounce — having been obtained, the cotton and bag should be wet with it, and over all can wisely be drawn another bag, to serve as a boot, made of chamois skin, kid, or other thin leather; and that be fastened at the ankle by means of a tape. As often as necessary to keep the dressing moist, a little of the solution should be poured into the boot.

Unless the case be a very aggravated one the soreness should generally have disappeared at the end of a week or ten days; but thereafter for a time it would be advisable to dress the foot and apply the solution in like manner after every hard day's work.

Dew-claws are occasionally the cause of lameness. They are sometimes torn off, and the wound left as a rule heals very slowly. A condition that is quite as troublesome exists where a claw has grown to excessive length and curls in. It cannot then be worn away at the end like the others, and makes the dog actually lame or causes him to favor the affected foot and not put it fairly and completely on the ground. Increasing steadily in length and curving in always, it eventually must penetrate the foot, when the lameness will be very decided and continually on the increase.

The longer the trouble is allowed to persist the greater the discomfort and difficulty of removing the offending claw. Sooner or later it may cause severe inflammation and swelling of the toe.

To remove the excessive growth, sharp wire-nippers or cutting-pliers should be used. It would not be advisable to cut off much of the claw at one operation, but, instead, it were best to snip it little by little until it is reduced to normal length; and thereafter it should be watched and the cutting repeated from time to time as necessary.

Occasionally the result of injury, which may even be trivial, a dog's toe becomes inflamed and swollen, causing him to go lame; and in the course of a few

days he sheds a claw. In such case, after the foot has been bathed with hot water and thoroughly cleaned, it should be covered as recommended in foot-soreness, and the patient laid up and kept on rather low diet until the toe has healed. Meanwhile the foot should be occasionally wet with a solution made of carbolic acid, two drachms and water, one pint. The claw may grow again, but the chances are against it. Its loss however is not likely to occasion any considerable inconvenience.

When a claw has been torn off there is generally for several hours an oozing of blood from the wound. If that is troublesome it were best to cover the foot with a handful of dry flour, and bandage. After the bleeding has stopped the foot should be dressed, and the dressings be kept wet with the carbolic solution.

After being affected for a long time a claw is sometimes lost because of a sinus or narrow canal in it. This is the result of a small circumscribed inflammation and consequent accumulation within the claw, and final discharge of the latter. The cause of the lameness produced is not easily determinable, for aside from the affected foot being a little warmer than the others, and perhaps slightly more sensitive under handling, there is nothing to indicate the real nature of the trouble. The following ingenious method of reaching a diagnosis has been suggested: After drying the foot thoroughly, place it upon a sheet of clean, thick, white blotting-paper, and force the dog to stand on it as heavily as possible. If a spot of moisture be left upon the paper, further close examination of the foot will exhibit on the worn lower surface of one of the claws a small hole of the minutest size, from which exudes a thin watery fluid. If this can be entered with a fine wire or probe, a sinus of course exists, and the cause of the lameness is explained.

A cure cannot be effected without the use of the knife. After soaking the foot well in warm water, to soften the horny substance of the claw, as much of the surface as can be easily removed should be carefully pared away. That done the foot should be again soaked and more of the claw pared. This method should be repeated until the entire claw is removed. The sinus will then be uncovered. Now comes the final operation. A fine probe having been inserted and forced to the bottom of the sinus, with its point guided by this and its edge downward, a sharp knife should be entered at the opening of the sinus and made to cut its way in and out. Thus the ball of the toe will have been slit and the sinus laid open throughout its entire length.

For a few days it will be advisable to keep the edges of the wound slightly apart by means of a small bit of clean linen. After sprinkling over it a little powdered iodoform, the wound should be dressed as for foot-soreness. Either of the solutions mentioned in the foregoing, chloride of zinc or carbolic acid, may be subsequently used to keep the foot moist. It is scarcely necessary to add that the operation should not be undertaken except by a professional.

A claw so affected is not likely to grow again. While its treatment is easy in skilled hands, provided the trouble is recent, after it has existed for a long time the only alternative may be to amputate the toe.

Over certain joints and immediately under the skin are located mucous capsules, called bursæ, which now and then become inflamed and cause lameness.

The hock and elbow seem to be most often affected by that trouble; which if neglected is sure to result in lameness. It is generally caused by a blow or other direct injury. At first inflamed, the capsules may be filled with either blood, a sero-fibrinous fluid, or pus; and the changes occur quite rapidly. They may also be distended with a mucus-like fluid, and the walls become much thickened; in which event the changes are gradual, and the process a chronic one from the first. Then inflammatory symptoms may be entirely absent during the course, or too mild and unimportant to be appreciable.

In the acute cases there is usually some, but not great swelling, and tenderness appears on examination. In such, friction with a stimulating liniment may be applied; or around the joint may be painted the tincture of iodine. If there is much swelling and the capsules are greatly distended, their contents should be drawn off, or evacuated through a free incision. The latter is the operation indicated when the fluid within is pus; and the cut should be kept open for a time by a drainage-tube. That the walls of the cavity left may unite, it will likely be advisable to either inject the tincture of iodine, for the purpose of creating a healthy inflammatory process, or use a strong solution of the nitrate of silver — 1 to 10. Thereafter the wound should be dressed twice daily, the covering kept wet with the carbolic acid solution, and bandages be applied to keep the cavity's walls firmly together.

The synovial membrane is a thin, delicate membrane attached to the extremities of bones which form joints. It lines the latter and secretes a fluid the purpose of which is, as it were, to keep the joints well oiled. Inflammation of this now and then occurs and causes lameness. As a rule it is the result of a direct injury, as a blow or sprain, falling from a height, etc. The symptoms are swelling, heat, and tenderness. The quantity of the natural secretion is increased and consequently the swelling may be great; and that secretion may remain unchanged or become thickened, or even purulent.

If the nature of the injury is recognized early and proper treatment promptly applied, recovery is speedy; but neglected cases as a rule prove very tedious.

The essential treatment is rest and the application of counter-irritation. To paint around the joint with the tincture of iodine is the wisest step to take at first; and after the soreness within has materially lessened, friction with stimulating liniments is commonly advisable.

An acute attack of synovites may terminate in the chronic form. The secretion within the cavity of a joint may, as stated, become purulent; but that grave accident is not likely to happen unless the joint has been punctured, there is

an infected wound near it, or serious inflammation has occurred in its immediate vicinity.

On pus forming, the cavity of a joint is converted into an abscess, and the usual signs are manifested — swelling, heat, redness, and constitutional disturbance. Recovery without loss of the joint is then impossible.

ACUTE OSTEOMYELITIS.

Following inflammatory diseases, and especially the infectious, there now and then, but only rarely, appears the disease of the bones termed osteomyelitis. Puppies are the most frequent victims of the acute form; while occurring after maturity it is generally the very old that suffer; and in them the trouble is chronic and of slow growth.

The disease is an inflammation within the bones, of their marrow, and it commonly results in multiple abscesses. As a rule the joints of the largest bones of the legs, and oftener than otherwise of the forelegs, are involved by the acute form; although it sometimes exhibits a preference for the ribs. And owing to its resemblance to rheumatism, doubtless cases are often mistaken for that disease.

The general acceptance is that it is caused by a germ, termed staphylococcus.

Swelling and tenderness of the affected parts and constitutional disturbance, as indicated by fever, are the most prominent signs; and the same occurring after distemper, diphtheria or other infectious disease, this affection might rightly be suspected.

Recovery from both forms is possible, but since deformity is invariably left and the dog practically ruined, while it would be necessary to persist in treatment for a long time, it could not be encouraged.

The manifestation of the chronic form is a "bunch" or tumor of compact or spongy bony tissue on some bone, and generally one of the vertebra or bones of the spinal column.

A surgical operation is required in the removal; which should only be attempted when the bunches are likely to occasion much trouble as they grow larger.

CHAPTER IV.

RHEUMATISM.

RHEUMATISM is a disease which manifests itself in two distinct forms, namely, the acute and chronic.

The first is characterized by fever; and its chief local manifestation is an inflammation of the joints. Its exact nature is unknown, though it is probably of microbic origin. Indeed in a very large number of cases under bacteriological study one observer has been able to isolate a peculiar bacillus to which he ascribes causative influence. He has further been able to transmit this organism to lower animals and induce symptoms and conditions in them comparable to those observed in man; and again to obtain from these subjects that same peculiar, specific bacillus.

Chronic rheumatism is a non-inflammatory affection which develops slowly and gradually. While it usually attacks the joints, it may be limited to the muscles; or both joints and muscles may be involved.

The acute form, commonly termed rheumatic fever, is but rarely experienced by dogs; nor are they often victims of the chronic joint affection; but they quite frequently suffer from attacks of so-called myalgia, in which the muscles and structures to which they are attached mainly suffer, although there is often more or less stiffness of adjacent joints.

Such attacks are not invariably of very slow and gradual formation. Now and then they assume a somewhat acute form; and in occasional instances they are attended by fever, but the same is rarely pronounced, the temperature seldom rising higher than one or two degrees above the normal.

They have been thought to be due to an attenuated form of the virus of acute articular rheumatism, notwithstanding in nearly all cases they seem to be the results of exposure to cold, damp, or strong draughts, especially after hard exercise, warm baths, during free perspiration, etc.

There is good reason for the belief, however, that the so-called subacute and chronic rheumatisms are not at all rheumatic in nature, and that no etiological relation exists between them and acute rheumatism.

In most victims there doubtless exists a constitutional predisposition or tendency to rheumatism, which there is reason for believing is in great measure the consequence of accumulation within the system of certain waste materials which should have been expelled through the avenues designed for such, as the

bowels, kidneys, skin, and lungs. Take for example a dog that is too fat, kept much on the chain, yet still generously fed. Exercise, that grand eliminator of waste, being denied him, his system in time becomes more or less choked up with effete and poisonous matters. Now let him be exposed to cold, damp, air draughts, or the like, and he will likely suffer from rheumatism in consequence. In other words, he is then in a condition which urgently invites the occurrence of that affection. Whereas had his system been kept well freed from those retained matters he might have escaped the painful attacks.

Heredity doubtless plays a part in this disease, and all else being equal, a dog whose sire or dam has suffered from rheumatism would be more liable to be similarly affected than one of healthy parentage.

Rheumatism is met with in all ages, but the form common to dogs has a decided preference for old subjects; whereas the acute and subacute forms usually attack puppies.

The breed seems to exert but slight influence, the disease being encountered among the large and the small, the long-haired and short-haired, but sporting classes furnish rather more than their proportion of victims; possibly because they are often run too hard and are but indifferently cared for afterward. Conditions of ill-health, particularly digestive disturbances and general debility, seem to exert a slight but still decisive effect, and favor the occurrence of rheumatism.

The disease may attack any part, but it has a preference for the shoulders — in which situation it becomes the so-called kennel-lameness or chest-founder — and the loins, where movement is sometimes so painful that power seems to have been completely lost in the hind legs. The trouble is then easily believed to be paralysis. Less often rheumatism affects only a single joint, as the knee or stifle. Again, it may be limited to one or to a small number of muscles.

Rheumatism is doubtless often mistaken for sprain, from which in some cases it is quite difficult to distinguish it. A joint that has been attacked is not as a rule swollen to any considerable extent; nor is there any marked change in the appearance of the muscles involved; therefore oftentimes the true nature of an attack can only be determined by waiting and watching.

Rheumatism often, but not always, exhibits a tendency to shift about, and if in a doubtful case a foreleg is lame to-day and a hind leg to-morrow, the real nature of the trouble must be quite evident.

When the shoulders are affected the dog moves very stiffly and with short, mincing gait, he being unable to advance his forefeet as usual and take steps of ordinary length; and if they are pulled forward, as they would go in walking naturally, he cries out in great pain. His disinclination to move is very marked, he evidently shrinking from doing so through fear of adding to his suffering; and although he may come when called, it is with great reluctance.

Torticollis is rheumatism of the neck. The muscles, some or all, on one side of the same, and at times the throat, are implicated. The head is generally

carried lower than usual, also toward the affected and painful side. The victim is very evidently afraid to bend his neck, for when he turns he rotates his entire body in a pivot-like manner. He gives further evidence of pain while eating if his food be placed on the floor, it doubtless being intensified by dropping of the head and bending of the neck.

The affected muscles are contracted and fixed, and found on pressure to be tightly drawn and hard. They are also very evidently painful, for the subject shrinks and likely cries out when they are touched.

As a rule these pronounced symptoms are not continuous, but instead are for a time much less severe, the muscular rigidity and spasm being relaxed. For two or three hours, aside from some stiffness and unusual care in getting about, the poor dog seems fairly well; but a sudden and unguarded movement, as starting up too quickly after a nap, causes a return of all the evidences of his painful infliction.

In cases in which the rheumatism is located in the loins the affection is called lumbago. This form of the disease may be termed acute, for its onset is sudden — sometimes intensely so — and the affected muscles are very painful and sensitive. After lying down the victim will not endeavor to get up unless absolutely forced to do so; and then it is only very slowly and reluctantly. Indeed all movements are painful, and he stands with back arched, or when he walks he drags his hind legs as though partially paralyzed. But in certain positions his sufferings are even more intense, as while stooping to reach his food, or when his bowels are moving, especially if there is straining; in consequence of which he cries or howls with pain.

So severely does he suffer, unless relief comes speedily there is soon seemingly complete loss of power in the hind legs; but not of the nature of paralysis, however, for the loss is not real, the condition being due wholly to lack of effort. And movement is sometimes resisted to such extent, through fear of pain, that the bladder becomes over-distended; which condition, if allowed to persist, will result in true paralysis of that organ. The fear of pain also often prevents effort to move the bowels, and obstinate constipation is the consequence.

Rheumatism may run a rapid course and speedily disappear without any special treatment, or it may persist for a long time and prove exceedingly obstinate. One attack favors the occurrence of subsequent attacks.

Due regard must be paid to hygienic measures. The diet should be nutritious and easily digestible. It ought, also, to be in proportion to the need. That is, with overfed patients some restriction should be practised; while those that are not well nourished and strong should be generously fed. As soon as possible regular exercise should be adopted; and that also ought to be duly adjusted, the overweighted and inactive being forced to take goodly amount.

The quarters should be dry, warm, and accessible to sunlight; and during the painful period quiet should be the rule, exercise being admissible only after

the disease has been routed; its purpose being to assist in building up the general health.

Local measures hold first place. While the pain is severe, decided relief may often be obtained by means of hot baths, the patient being kept in the same for nearly ten minutes. If the foreshoulders are affected, he should be immersed up to his neck, but not necessarily so deeply if the loins alone are the seat of the trouble. The water should be at first "comfortably warm," and after a short time very hot water be continually added to the bath until the temperature is as high as can be borne. On being removed the subject should be sponged, then rubbed dry with soft towels, and afterward wrapped in hot blankets.

While the pain persists but little can rightly be expected from the use of liniments, yet they can be tried if one has confidence in them, and the following promises well:—

Chloroform, tincture of aconite-root, and oil of cajuput, of each one-half an ounce; soap liniment, four ounces.

This in generous quantity should be quickly rubbed through the coat to the skin over the affected parts, two or three times daily; and at once covered, to prevent evaporation.

The parts affected by rheumatism should be kept constantly warm, because exposure to air alone, even if it is of only a little lower temperature than the body, will cause exacerbations of pain. Therefore where the foreshoulders or loins are the seat of the trouble a jacket or blanket should be fitted closely and nicely adjusted; and the same be made of several thicknesses of flannel or cotton wadding. While for leg-joints, flannel bandages can be used.

That ointments may have considerable effect, the rubbing must be more vigorous than that required with liniments. As soon as the tenderness has subsided sufficiently to permit the use of the former the following might be tried:

Salicylate of sodium, thirty parts; iodoform, ten parts; extract of hyoscyamus, five parts; vaselin, one hundred parts. This should be applied quite freely, and rubbed into the affected joints until it has disappeared.

Another ointment of value in very painful cases is composed as follows: Vaseline, twenty-five parts; salicylic acid, four parts; sodium salicylate, three parts; extract of belladonna, one part.

To be well rubbed in, and then covered with cotton.

As soon as the condition of the painful parts will permit, massage and movements in the natural ways should be practised, two or three times daily, for the purpose of keeping the muscles active and well nourished, and preventing atrophy or wasting. If neither of the ointments recommended is being used, some simple liniment can be employed if desired; and the camphorated soap liniment is quite as serviceable as any other.

Where joints are affected and the disease has been of long standing, painting

with the tincture of iodine or the drawing of small fly-blisters will likely have salutary effect.

The internal remedy from which the best results may be expected is the following:—

Salicylate of sodium, two drachms; water, six ounces.

Of this the dose for largest breeds is one tablespoonful and one-half; medium size, one tablespoonful; fox terriers and dogs of similar size, one-half a tablespoonful; toys, one teaspoonful.

It should be administered every two hours until marked improvement is noted; after which three or four times daily will suffice.

If it fails to have a beneficial effect and the case is becoming chronic, the following should be tried:—

Iodide of potassium, two drachms; salicin, three drachms; water, one pint.

To be given every two hours, in doses as follows:—

Largest breeds, one tablespoonful; medium size, three teaspoonfuls; fox terriers and the like, two teaspoonfuls; toys, one teaspoonful.

Measures to improve the general health should of course be resorted to if indicated; and cod-liver oil, quinine, and iron, are the tonics commonly found of greatest value in this disease. In old debilitated subjects, in which it proves very obstinate, the syrup of the iodine of iron is usually most appropriate. It should be given three times daily, with the food, and in the following doses:—

For largest breeds, fifteen drops; medium size, twelve drops; fox terriers and such, eight drops; toys, four drops.

SECTION X.
SURGICAL AFFECTIONS.

CHAPTER I.
WOUNDS.

It goes without saying that in cases of fractured bones, severe wounds, etc., surgical assistance is very generally necessary, but it is not, by any means, always at hand, even in cities; hence at least a little knowledge of such injuries and the essential treatment in ordinary emergencies should be possessed by all; and by its prompt application the worst effects of many accidents can be prevented.

Wounds are divided into certain classes, namely, the incised or clean cut, the lacerated or torn, the contused or bruised, the punctured or penetrating, and the crushed. To these may be added poisoned wounds, bites, stings, and scratches.

Incised wounds, usually made by sharp-edged tools or instruments, or glass, are generally produced with only little violence and admit of repair most easily. They are, however, often dangerous at first through bleeding; while torn, bruised, and crushed wounds, as a rule, bleed but very little. If only small vessels, the so-called capillaries, are divided, the blood flows steadily, and is of an ordinary red color, it being a mixture of arterial and venous blood. If a vein be cut, the flow is also steady, but the color of the blood is dark-red — almost blue-black or dark purple. When an artery has been cut, bright red blood comes from the wound in jets or spurts, which are in unison with the pulsations of the heart.

All cut wounds should be promptly washed out by a stream of water — either warm or cold — poured from a pitcher or other convenient vessel, and dirt and all foreign bodies or particles with absolute certainty removed. The edges should then be brought together, and kept in place if possible.

When pressure can be applied and persisted in, even arterial bleeding, the most difficult to control, can always be checked. This will be practicable over a bone of considerable size, the same furnishing a solid foundation on or against which the cut vessel can be forced and held by a compress; which is made by folding a fragment of cloth into a thick pad, an inch or more square, as required. Laid on the wound, the edges of which have been brought together, it may be kept in place by a bandage firmly applied.

When the cut is not immediately over a solid bone the difficulty of stopping bleeding may be greater. Unless the hemorrhage is very severe, however, the following treatment is quite sure to be effectual: Take up a handful of powdered chalk, sulphur, magnesia, or common flour; turn the hand as quickly as possible and lay its contents on the wound, and hold the same there until a firm bandage has been applied. In very dangerous cases of bleeding away from home and such powdered materials cannot be obtained, dry earth or dust may be used instead.

It is advisable to stop if possible all bleeding by treating the wounds themselves, but when they are located on the legs it may be necessary to apply pressure above or below them. If the blood is spurting, and therefore coming from a cut artery, the leg should be encircled by a bandage or cord above the wound, between it and the body, and the same be tightened gradually until the bleeding has stopped. Only rarely is hemorrhage from a vein difficult to check in the wound; but if so, the leg must be ligated by means of bandage, strap or cord, below the cut; as the blood flows in the veins from the extremities towards the heart.

Wounds that are promptly and properly attended to may heal within a week, or, as surgeons say, by "first intention;" that is, by dry union and without the formation of pus or "matter." In order that they may do this they must be thoroughly cleaned, all bleeding stopped, their edges brought together, and thereafter tainted air be entirely excluded.

If a dog has been wounded and stitching is necessary, one must not shrink from the duty through fear of being bitten, for rarely will there be any danger of it, because he and his kind when injured very generally appreciate that what is being done is purely for his good; moreover, dogs are far less susceptible to pain than members of the human family.

In cases of extensive wounds which gape open it is almost always necessary to stitch the edges together; and such operation is so easy it may be undertaken by anyone who has a firm hand. In the absence of a "glover's needle" one of ordinary kind may be used. It should be large always — No. 7 or No. 8 — and "threaded" with coarse white silk. Or if only fine silk is obtainable, several strands ought to be employed. While if silk is not at hand, common white linen thread may be used. Unless the wound gapes badly, when they should be nearer, the stitches ought to be about half an inch apart. The skin should be entered well back from the edges, to prevent tearing out. It is generally easiest to pass the needle in through one lip of the cut, and bring out all but a few inches of silk; then out through the other lip from the inside. The silk may then be cut, but the part left should be several inches in length, to enable the operator to draw the edges together into a natural position and tie the knots squarely, otherwise they must slip.

After stitching, if carbolic, iodoform, or other antiseptic gauze can be

obtained, eight or ten thicknesses of it should be bound over the injured parts. If pus does not form, or, as commonly expressed, the cut does not "matterate," this dressing can be left undisturbed for four or five days; when the stitches may come out, and the wound be bathed and dressed again. To remove the stitches, cut one side of the loops of silk or thread just below the knots, and pull upon the knots with the fingers or tweezers. In the absence of antiseptic gauze, which is on sale with druggists, a compress of old linen should be applied, and kept wet with a solution of carbolic acid, two drachms to one pint of water. If pus forms and the wound opens, it cannot be left to itself four or five days, but must be cleaned and dressed at least twice daily. A stream of water from a vessel or sponge should be allowed to run over it, to wash away the pus; but the wound must not be pressed by a sponge or rag, for it would retard healing. After thorough bathing and cleansing, fresh antiseptic gauze should be applied; and it may be dry, but if linen is used it should be kept moist with the carbolic acid solution.

Lacerated wounds are generally inflicted in fighting. They are irregular in shape, seldom bleed much, but often inflame, sometimes mortify, and hardly ever heal by "first intention." In the treatment of such the first thing is to secure absolute cleanliness, removing with a gentle stream of water and a soft sponge or rag, all dirt, hair, etc., and then the torn skin should be dried with a soft cloth. This preparatory treatment is absolutely necessary, for a mere scratch, if irritated by the presence of a particle of dirt or other foreign matter, may in consequence become badly inflamed, and even an abscess form. After the wound has been cleaned and dried, its edges should be brought as nearly together as possible, a little iodoform powder be sprinkled over it; and, finally, the compress and bandage be applied.

Wounds of this nature at first generally require dressing once each day, and after the third or fourth day, twice daily, otherwise they cannot be kept clean. The dressings ought also be wet at least two or three times a day. It were better still if they be kept constantly moist; and the employment of the carbolic acid solution is very generally advisable.

If a wound becomes much inflamed and evidently very painful, and an abscess threatens to form, poultices of flaxseed meal must displace other dressings for a time.

The parts surrounding a severe, contused wound are broken or torn; the edges are irregular or rough; there is less gaping than in either incised or lacerated wounds, and but little bleeding. The treatment of such wounds is very similar to that already advised for lacerations. The fact should be kept in mind that the cleansing process is more difficult, therefore it must be very thorough. It can be accomplished by means of a soft sponge and tepid water.

One of the best dressings for wounds of this character is the compound tincture of benzoin, because it seals them up completely and thereby protects them

from any poisons that may be in the air. It should be painted on with a camel's-hair brush once or twice daily; after which the wound should be covered with a thick compress of linen that has been smeared with a little oil, mutton-tallow, fresh lard, or vaselin, to prevent its adhesion. Carbolized oil, which is made of 5 parts of carbolic acid and 95 parts of cotton-seed oil, is also a good application. When contused wounds are extensive and likely to be considerably inflamed, it is generally best to immediately apply cold water and keep it on constantly thereafter, for the purpose of checking the rush of blood to the affected parts, and thus prevent in a measure the severe congestion which is quite certain to follow. If, however, some hours have passed since the accident, and the wounds have become greatly inflamed, as a rule it will be necessary to treat them with poultices.

The seriousness of punctured wounds depends almost entirely upon the parts reached. When made with a sharp, clean instrument, as a needle or a thorn, if the wound does not affect any important part, it generally heals at once by Nature's own process, and without assistance. When, however, the flesh is penetrated by a blunt, rough, or dirty instrument, as a rusty nail, the wound does not heal kindly, for the tissues are torn and bruised. Moreover, rust, dirt, or other foreign matter has been carried in, to be retained, decompose and irritate; and thus severe inflammation is very liable to ensue. Again, it is in just such wounds that lockjaw is especially liable to occur. They are also troublesome from the fact that they often close up or heal near the surface, while pus remains at the bottom, to accumulate until finally it forcibly reopens at the top and discharges. Thus the course may be that of a frequently recurring abscess.

Where a wound has been caused by a thorn or splinter of wood, and the same is still in it, if necessary the opening should be enlarged to favor removal. Wounds made by a rusty nail or any dirty thing must be cleaned as thoroughly as possible, and a syringe used for the purpose if required. Such wounds ought to heal up from the bottom, and be kept open at the top until the healing below is complete. If they close prematurely, their edges should be drawn apart, and a string, first oiled, be introduced to prevent a recurrence of the trouble; and this seton should be changed every two or three days. Externally, water or carbolized oil may be applied, unless considerable inflammation sets in; in which event poultices must generally be resorted to.

Crushed wounds are usually serious, bones being frequently broken. There is but little bleeding, because the vessels are paralyzed. The immediate danger is likely from shock, after which there may be inflammation or still more serious trouble. Assuming so many radically different forms as these injuries do, it is not possible to define even a general line of treatment, for manifestly in some instances recovery may take place readily without interference, while in others amputation may be imperative.

Poisoned wounds include not only wounds which are rendered poisonous when the injury occurs, but also wounds and scratches originally free from poison but which have been subsequently poisoned by contact with virulent matters. Wounds from the bites and stings of healthy animals and insects, and others from diseased animals, all properly belong on the list of poisonous wounds.

Bites inflicted by swine, the fox, skunk, and a few other animals should be quite as carefully treated as those of dogs thought to be rabid, because such wounds are often highly poisonous.

To at once cause a wound made by the teeth of an animal, that can possibly excite serious trouble, to bleed freely is one of the wisest steps, for then the poison will be much diluted, if not washed entirely away. Therefore in all cases in which such a wound is small and deep, as when caused by a single tooth, it is advisable to use the knife and make two quite long and deep cuts, and have the same cross each other. The next essential, which must never be delayed longer than absolutely necessary, is to cauterize the wound. As a rule the most convenient means is a hot iron. When this is resorted to, the iron wire, rod, or whatever is used, should be red hot, or at a white heat; for the application of such is really less painful than that of an iron merely "black-hot." Among other caustics are carbolic acid crystals, the nitrate of silver, nitric and sulphuric acids, and caustic potassa.

Where a bite has been inflicted by a dog strongly suspected of being rabid, and it is on one of the extremities, even before making the free incisions it were best to ligate above the bite, by means of a strap, rope, twisted handkerchief, or anything of the sort, to prevent the poison in the wound from entering circulation. The ligature, however, must be applied within a few minutes, possibly two or three, after the bite, otherwise it cannot be effectual. It must also be drawn very tightly indeed, — almost cut into the flesh.

A wound may have been doing well and suddenly become poisonous. All things considered, the danger of such change is the greatest where filth abounds and neglect has been exhibited. The indications of it are very great increase in the inflammation and swelling; and instead of being of a bright, healthy red color, the wound is generally somewhat purplish. The tissues beneath and surrounding it are also much more swollen or tumefied. Surgical assistance is then imperative, for likely free incisions must be a part of the treatment to be applied.

Dogs sometimes suffer so severely from stings of bees or wasps that they are driven frantic, and even their lives endangered. One of the simplest and most convenient remedies is mud; and the victim should be promptly plastered with that, or buried up to his neck in it. Spirit of hartshorn — ammonia — also brings speedy relief when applied to the stung parts.

Dogs appear to be even more fortunate than man in escaping snake-bites,

but now and then they fall victims. The injury is very generally inflicted while far from home, and where there is scarcely a choice of remedies. Tobacco often acts well; and in the absence of anything better, a cigar, piece of "plug," or mouthful of smoking-tobacco should be chewed rapidly and applied to the wound. In the West this is considered by many a potent remedy for rattlesnake bite when mixed with a goodly quantity of baking-soda.

Wounds which involve the joints and admit the air to the same are generally much more serious than injuries of like extent elsewhere, because permanent disease and destruction of the affected joints are liable to result.

All joints contain and are lubricated by a fluid called the synovia, which is a transparent, yellowish-white or slightly reddish fluid, viscid, like the white of an egg. A discharge of this is positive evidence that a joint has been entered. Other indications are great tenderness and a change in the gait, the dog keeping his foot from the ground, or bearing as little weight on it as possible, and carrying his leg in a flexed position.

If the instrument that entered the joint is small, sharp, and clean, the wound may heal rapidly and no trace of the injury be left; but from large, ragged wounds, or wounds that have admitted dirt or other foreign particles, there is extremely liable to result a severe and tedious inflammation, attended by the formation of pus; and that in turn be followed by disintegration of the ends of the bones. The joint affection is then for a time substantially a frequently recurring abscess, and if healing takes place there is union of the bones and a stiff joint. But such result is not common. Far more often his blood becomes poisoned and the victim dies from septicæmia.

When a joint has been entered the wound must be thoroughly cleaned, and thereafter the air be excluded from it as much as possible, or at least sure measures be employed to prevent the admission of any of its usual impurities.

In cleaning the wound, if it is small and deep and dirt or other foreign matter was carried in by the offending instrument, it will likely be necessary to employ a syringe, to wash it out thoroughly; and if so, instead of simple water, an antiseptic solution should be used. Quite the best is a solution of corrosive sublimate, 1 to 1000, which can be prepared by any druggist; or the operator might buy tablets of the sublimate, with full directions as to their use under various conditions, and himself make the necessary solution.

After a thorough cleaning, the hair should be clipped from the adjacent surface, and the edges of the wound brought into place, stitches being taken if needed.

Whether or not the subsequent dressing should be dry or wet will depend upon the character of the wound. If large and ragged, the chances of a speedy union and healing without the formation of pus must be small, and probably a wet dressing will be the best. When that is to be employed, powdered iodoform should be first sprinkled onto the wound, and over it a piece of absorbent,

borated, or carbolized cotton, of generous size, be bound, several turns of the bandage being made. This dressing should then be wet, and thereafter kept continually moist with a solution of corrosive sublimate, 1 to 2000.

Various kinds of antiseptic gauze are on the market, and they owe their peculiar property to the carbolic acid, iodoform, or sublimate incorporated in them. One of these should be employed if the dressing is to be dry. The wound having been sprinkled with iodoform, as in the first instance, a large, thick pad made of the antiseptic gauze chosen should be laid over it, and bound in place by strips of the same gauze, which should always be used generously. Over all a cotton or linen bandage should be applied.

The injured leg should then be splinted if possible, to keep the joint at rest, and the dressing be allowed to remain undisturbed for at least five or six days, unless there has been much discharge and it has saturated the bandage; in which event all coverings should be removed, the wound washed with 1 to 1000 solution of the sublimate, sprinkled with iodoform, and clean gauze applied.

Every joint that has been wounded should be kept as immovable as possible for two or three weeks after entire repair has seemed to have taken place; and even then only gentle use be allowed at first. Any stiffness of the joint that persists may, after a time, be treated by massage and stimulating liniments, as camphor or soap-liniment.

In the foregoing, iodoform has been frequently recommended as a dressing for wounds, and lest harm result from its use it is best that the fact be given due prominence that this powder now and then causes much irritation, and it is even capable of poisoning; therefore it must always be employed cautiously, never in any case more than one-sixth of a teaspoonful being applied in a single dressing, even if the patient be one of the largest breeds; while if it irritates, its use is wholly contra-indicated. Where the wounds are extensive and a greater quantity of iodoform or other like-acting agent would seem required, to one part of iodoform should be added five parts of boric acid, which is practically non-toxic, and this combination be used in the dressing. A teaspoonful of the same would be within the safety lines; and the wound must be indeed large that required a more generous quantity of dusting-powder. However, if more was actually needed, dry powdered sulphur might be used. It is claimed by some that this very simple remedy, powdered sulphur, is even a more powerful antiseptic than iodoform; and certainly large quantities could be safely applied to raw surfaces.

Had much sulphur been left in a wound for several days, after washing it out the wound should be carefully bathed with a solution of corrosive sublimate, 1 to 2000.

When mixed with glycerin, powdered sulphur is even more active as a germ-destroyer than while dry; hence a paste so composed may prove specially efficacious in suppurating and foul-smelling wounds or ulcers.

BURNS AND SCALDS.

Extensive burns and scalds are always serious even if only superficial. The pain is wearing and exhausting; important internal organs are liable to become affected; and the healing stage is long and debilitating. In severe injuries of this character there is shock to the nervous system, and the same is followed by prostration, or may be collapse. Gangrene is also possible after such accidents. While if the general health is not good a seemingly trifling burn or scald may be the beginning of an exceedingly obstinate skin affection. It is important, therefore, that some soothing application be made as soon as possible to burned or scalded parts.

Generally, for a time at least, domestic remedies must be relied upon. Among them a solution of common baking-soda is quite effectual; and if promptly applied, it will often prevent blistering and destructive changes in the skin. A handful of the soda should be thrown into a pint of water; and with a cloth wet in this the injured parts should be covered and kept constantly moist. Dry flour and powdered starch are also serviceable remedies, but less active than the soda-solution.

If the injury is a severe one and large blisters have formed, they should be promptly pricked and their contents evacuated, after which the air should be, as completely as possible, excluded from the affected parts. An old and long-tried remedy that is serviceable in such cases is the so-called "carron oil," which is composed of equal parts of linseed-oil and lime-water. When this is used, a cloth dipped in it should be applied to the injured parts, and over the same there should be bound a large pad of absorbent cotton; or if that is not at hand, common cotton wadding will do. This oil has a very offensive odor, and likely many would seriously object to its use for that reason.

Another very effectual application, but objectionable for the same reason as "carron oil," is an ointment composed of vaselin and ten per cent of iodoform. This speedily causes the pain to disappear and healing to take place rapidly without much suppuration. In absence of anything better, vaselin, fresh lard, or sweet oil may be used.

Oily dressings must not be allowed to become dry, and they ought to be often renewed during the first two or three days; after which there can generally be substituted the ointment of the oxide of zinc or simple vaselin, in each ounce of which there should be incorporated ten grains of carbolic acid.

For burns caused by powder, cider vinegar diluted with one-half its quantity of water, acts well; and its good effect may be heightened by the addition of a little powdered chalk.

Burns that are deep and which have destroyed much of the skin and many of the hair-follicles, leave permanent disfigurement.

In severe burns or scalds, in view of the danger from exhaustion, the strength must be sustained by highly nutritious diet; also stimulants if rapid failure is threatened.

UMBILICAL HERNIA.

Umbilical hernia is, as its name suggests, a protrusion of a portion of the intestine or its covering through an opening at the navel. Occurring in early puppyhood, during which period of life it is by far most common, it may be congenital—that is, present at birth—or accidental. In the first instance the intestines are located in the umbilical cord and never properly covered; while in the other, the affection is due to imperfect closure of the opening in the walls which existed at birth.

In hernia in puppies the protrusion is generally noticed a few days after birth, and gradually grows more pronounced for a time, or it may mature, as it were, rapidly, and within a few days be quite complete, and nearly as extensive as ever after.

Occurring after puppyhood the greatest proportion of its victims are females that have been frequently in whelp, and with large litters. Or it may be the result of a fall or severe strain otherwise produced.

The trouble is easily recognized, there existing a soft enlargement at the navel, varying in size from a filbert to an English walnut. A cure now and then takes place spontaneously, but such happy result is far from common, and an operation is very generally necessary. During that the intestine is pushed back, and the opening in the abdominal walls, through which it protruded, is closed by stitches. The following is a simple, comparatively safe, and easy method of procedure:—

If the patient is a pup six or eight weeks old, before the operation he should be allowed for a day only bread and milk, and then forced to fast for at least half a day. Finally his bowels should be unloaded by sweet oil. All in readiness for the operation, the hair should be carefully shaved from the parts over the rupture and a short distance beyond. Then, after they have been thoroughly cleaned with soap and water, there should be applied to them a compress of cotton or linen cloth wet with a solution of corrosive sublimate, 1 to 1000; and the same be kept on for about ten minutes.

The next step is to produce, as nearly as possible, local anæsthesia or absence of feeling; and for the purpose the parts might be sprayed with the following mixture:—

Chloroform, two and one-half drachms; sulphuric ether, four drachms; menthol, one-half a drachm.

This should deaden sensation for four or five minutes.

Were the patient of largest breed, and near, or had passed, maturity, the anæsthesia should be produced by a four per cent solution of cocaine, about twenty minims being hypodermically injected. While for smaller breeds it would be necessary to reduce the quantity.

A longitudinal incision should be made through the skin down to the sac, care being taken not to injure the same. The opening in the walls being exposed to view, the protruding parts should be pushed back, and with the knife the edges of the ring through which they passed should be freshened or scarified. They should then be drawn together by sutures or stitches of catgut, — two being usually required with pups, and three with old dogs, — and a little dry powdered sulphur be sprinkled over the edges.

In stitching the skin, silk can be used. Over the greater part of the incision the stitches may be quite close, but not tight. At one end of it however the last stitch should be some distance from the corner of the cut, that an opening of goodly size be left for free drainage.

A little iodoform having been sprinkled on, there remains merely to apply a compress of some antiseptic gauze, and bandage as neatly as possible. But the bandage must soon become disarranged and worthless. Fortunately, however, much swelling of the skin speedily occurs, and thus the parts within are in a measure protected.

To bathe first with hot water and afterward with a solution of sublimate, 1 to 2000, will be necessary, twice daily, while there is much discharge. When that has become slight, boracic acid may be applied after the cleansing process.

The patient must be kept in a warm place, and have bedding as fresh and clean as possible.

Recovery is generally complete before the end of the third week; and notwithstanding the absence of bandages and consequent exposure of the parts, nearly all patients operated on do well.

During the first week the diet should be a trifle scanty, and of the simplest articles of food, to obviate the danger of "bloating."

If a laxative is needed, sweet oil or magnesia may be given.

Dry powdered sulphur has been recommended for application to the parts within before the cut in the skin is closed. This is considered advisable because were iodoform used on very young pups dangerous toxicity might be produced by it. This objection, however, would scarcely hold with mature dogs.

ABDOMINAL SURGERY.

In no direction has greater advancement been made in surgical science than in the treatment of abdominal diseases and injuries. It is not very long

ago that to open the abdominal cavity was a much dreaded operation, to be employed only as a last resort; and from which only a very small proportion of recoveries could in the light of experience be expected. But all is changed now, and even in doubtful cases, in which diagnosis by other means is impossible, the abdomen is often opened and explored, with the greatest confidence that a few simple precautions will prove ample against harmful results if nothing abnormal be found.

Unfortunately it is not possible to restrain the movements of dogs after operations, and secure perfect disinfection, hence the mortality in such must be greater than in like operations in man, and especially in those which involve the abdomen, yet the author is of the firm conviction that in cases believed to be of intestinal stoppage, and certain others so generally fatal, the knife should be used much oftener than it is now. And notwithstanding the after-treatment cannot be all surgeons might wish, that which could be applied would surely be successful in many cases in which it is thought that operations must inevitably prove fatal.

Of course the abdomens of dogs cannot rightly be opened with the same freedom that those of mankind are treated, but it is urged that in all instances in which the end would likely be death without surgical interference, and were the patients members of the human family operations would be considered justifiable, then they should be performed with dogs. This the rule, not only must cases be saved that would otherwise have been lost, but the experience gained be invaluable, and canine surgery advance — not be almost at a standstill as it is now and has been for many years.

SECTION XI.

AFFECTIONS OF THE SKIN.

CHAPTER I.

ECZEMA.

ECZEMA is one of the most common and annoying affections of the skin with which dog-owners are forced to contend. It resists with exceeding obstinacy, as a rule, there being no royal remedy, nor even general method of management likely to lead to cures in a very large proportion of cases, owing in part at least to the fact that the disease may spring from a great variety of causes and present many peculiarities of form, thus necessitating quite as many modifications in the way of treatment.

Some cases of eczema depend upon conditions that are purely local, — that is, troubles with the skin only, — while others are due to diseases or derangements within the body. Some, also, are limited to small areas, while others extend over much of, if not the entire surface. Some, again, are simple eczemas, each of which may be the product of a single cause, and ought to yield readily to proper treatment ; whereas there are as often encountered others in which the disease is due to a combination of causative elements, — to several causes, — each of which it may be necessary to attack in turn and overcome before a cure will be possible. In many instances there exists on the same subject two or more forms of the disease. For example, on one part of the body of a dog there may be a large, deep-red and raw spot, from which there is a constant oozing in abundance ; on another part, a spot covered by thick scabs ; on the inside of the legs, groups of pimples ; while around the eyes and back of the ears the skin be dry and rough, and covered by thin bran-like scales. Finally, while it ought to be possible in most cases to discriminate between mange and eczema, mistakes are common, because of the intolerable itching invariably present in the latter ; and beyond doubt much the largest proportion of cases of that disease are assumed to be mange, and treated as such, with, of course, only negative results.

Unfortunately, so close is the resemblance between some of the classes of eczema, that really differ so widely, it is often exceedingly difficult, and even impossible, for the non-professional to distinguish between them. It follows

also that quite different remedies are required for these various classes, and to make at first the right selections can seldom be easy; consequently, oftentimes before the disease is overcome, the course of treatment has been long, tedious, and for a time disappointing; moreover it has been frequently necessary to change the remedial measures.

The term eczema is from Greek words that mean "to boil out" or "effervesce," and implies a condition of the skin characterized by an oozing. Or, in other words, in this disease there is a peculiar tendency of the affected skin to become moist through an oozing or exudation of a gummy fluid, that thickens into crusts or "scabs."

It is true that the skin affected is not invariably moist, for the eruption may be in the form of simple red spots or pimples, and the eczema remain quite dry from beginning to end; but even in these cases there is still a very marked tendency in the skin to become wet with copious oozing when irritated, as by rubbing or scratching.

From first to last eczema may be of one form, or assume successively several forms, the most common of which is the so-called moist form. This is manifested by some swelling and tenderness of the skin, which presents a dark red and raw appearance. From it there constantly exudes, and usually in quite large quantity, a gummy and adhesive fluid, which dries very rapidly in the air, and sticks and mats the hairs together; also forms crusts. While at first the skin beneath is reddened, swollen and moist, after a time it becomes dry and covered with scales.

This form is sometimes preceded by vesicular eczema, characterized by the formation of minute water-blisters or vesicles, which are nearly transparent and glistening. They are but slightly raised above the surface, and crowded together upon a highly congested base of deeply reddened and more or less swollen skin. The fluid in these vesicles or blisters is clear and watery at first, but soon becomes cloudy and gummy; and although it may be absorbed, the vesicles very generally break, and the discharge, adhering to the surface, dries rapidly and forms crusts.

Instead of by vesicles, eczema may manifest itself by an eruption of papules or so-called pimples, which appear in small or large groups on skin that is reddened and slightly swollen. These papules either change into vesicles and run the course of such, or dry into scales and crusts.

Eczema may also be an eruption of pustules, commonly called festers. The fluid in them, instead of being clear and thin, is about as thick as honey; and when expelled it dries into yellowish crusts. This and the vesicular form are generally found together.

Another form of eczema, quite common, is characterized by simple redness and perhaps slight swelling of the skin, under a thin layer of very fine, branny scales. The dark red spots which constitute this eruption cause it to resemble

erysipelas, especially since it is generally quite extensive; and frequently there are large patches of it here and there over the body; some also on the head and legs.

Still another form of eczema is an exaggerated or severe type of this just described, the essential difference being in the size and number of crusts. That is, instead of the crusts being small, thin, and bran-like, they are much larger and thicker; they are also far more abundant, and the skin beneath them is thicker and harder than in the other form.

The last two and the papular are always dry forms, while the others are moist.

Eczema may be acute or chronic. The latter is the most common. It is also by far the most severe and difficult to cure; for while the former is usually limited to a few small patches of the eruption, this form is generally much more extensive, and may attack every portion of the body, head, and legs, and even the tail.

As concerns the actual causes of eczema there is yet much to be learned. It has been considered by most non-professionals, also by physicians generally, to be a blood disorder, dependent upon faulty conditions of the stomach, liver, or other vital organs, although, of course, they have known that it may start with the application of external irritants. But recently, after long and careful study and observation, certain eminent specialists in skin diseases have announced their belief that it is a germ disease, and the true cause is the inoculation by a special organism or germ.

If that is a fact, then the previously recognized causes of eczema are simply predisposing causes. That is, as such they prepare the way for the disease, and render the soil favorable for the development of the parasite which is its real cause.

This theory is certainly within reason, but being in its infancy, — the micro-organism or germ, if there be one, yet to be discovered, and much else to be made clear before it can be accepted as positive, — the conditions and influences heretofore reputed to be real and exciting causes should be considered such until the etiology of old has been proved erroneous. It will also be quite safe to assume that if eczema is in some instances due to definite specific germs, in many others, germs have no part in the causation.

The external causes of eczema are many and varied. It may be the immediate result of irritating the skin, as by scratching; by which means the eczema accompanying parasitic diseases is generated. Acrid medicated applications, as croton oil, tincture of iodine, strong mercurial ointments, liniments containing large proportions of ammonia, turpentine, and the like, highly alkaline soaps, etc., are capable of producing it. It may be caused by the long-continued heat of summer, also by extremes of temperature, and especially by too hot baths in subjects having very sensitive skins. Water alone even may cause it in non-water dogs if sent into it often and allowed to remain too long.

Of the causes of eczema from within less is understood, but it is known that to injudicious feeding many of the cases are attributable; and in this connection it is proper to urge that, paradoxical as it may seem, eczema may be caused by over-feeding or by under-feeding; a highly inflammable state of the blood resulting from the former, and impoverishment of the blood from the latter; which conditions greatly favor this disease. Flesh foods also play an important part in its causation; and while too much meat generally causes it, by a deprivation of meat the system becomes debilitated, and thus the occurrence of eczema is invited as it were. On the other hand, starchy foods in excess induce disturbances of the nutritive functions, and eczema frequently results in consequence.

A very obstinate form also comes from chronic indigestion or dyspepsia. Want of exercise, and unclean and otherwise unhealthy kennels, are included among the causes; so, too, are influences, derangements or diseases that debilitate the system or impoverish the blood. There seems also to exist an unusual tendency to eczema among dogs of highly nervous temperaments, which is notable especially among those much inbred. That the disease is hereditary, as some writers have asserted, has not been proved; but even if not so, it is certainly more prone to occur in the offspring of eczematous progenitors than in others of families to which the affection is comparatively unknown. Its frequent occurrence with worms, and during gestation and dentition, suggests a relationship which in cases of worms especially seems quite intimate.

If eczema is contagious, it is assuredly not highly so; but in certain stages, when the oozing is profuse, the disease can be communicated by actual contact provided it is of sufficient duration. To be more explicit, a healthy dog might play with one affected with eczema and be many times in momentary contact without acquiring the disease; but were they allowed to occupy the same sleeping-box, and the healthy skin of one remained long in contact with the diseased skin of the other, from which there exuded the characteristic fluid, through this secretion the disease might be transmitted, and the healthy animal become eczematous.

Although under proper treatment eczema ought to yield quite readily, as stated in the beginning, as a rule it is a troublesome affection, and often proves very rebellious, especially in long-haired dogs. Moreover, once a dog is a victim, he is peculiarly liable to suffer from it again.

In this connection it is interesting to note that Hunter, one of the brightest lights in dermatology, divided skin diseases that affect mankind into three classes: "Those that sulphur would cure, those that mercury would cure, and those that the devil himself couldn't cure." Varying the remedies, and assuming dogs to be the patients, he would scarcely stray far who adopted much the same classification for eczema at the present day.

Before undertaking to effect a cure, the conditions of each case should be carefully analyzed, with the view of correcting hygienic or other faults in man-

agement, etc., that may exist, and determining the cause or causes, or at least acquiring as near an idea of them as possible.

Of the very few general rules which it would be well to follow the first is to use only applications that are mild and soothing where there is considerable inflammation, as shown by deep redness and perhaps swelling. That is, if the affected skin is of a bright red color, as in erysipelas, unless the applications were mild, they would add to the inflammation and existing trouble, instead of lessen it.

Another rule is to distinguish between the moist and dry forms of eczema, and treat accordingly. For instance, if there is much oozing, ordinary ointments could have but comparatively little effect, for they must be speedily washed away; therefore powders should be used at first, and after the oozing has been stopped, or very nearly so, it being liable to return, ointments containing the same or similar powers in considerable abundance should be applied.

Another rule bearing on washing suggests itself. Even water alone may intensify the inflammation of the skin; yet in most cases which seem to be of eczema it is advisable to preface treatment by a bath, not only for the purpose of securing thorough cleanliness, but to be on the safe side in event an error in diagnosis is made, and a case be one of mange instead of eczema. And that this precaution may be most effectual, it will be advisable in washing to use quite freely the strongest form of carbolic soap.

When positively certain that a case is one of eczema, if there be deep redness and swelling of the skin, and especially if an oozing from it, the dog should not be washed except when it is positively necessary, and then, instead of soaps, borax or bran should be used. The right proportion of the former is a handful to a pailful of water. For the same quantity of water half a pound of bran would be sufficient; and while it might be confined in a cheese-cloth bag, it were best to mix it with the water. Such a bath is not only cleansing but very soothing, and does much to allay the sensations of itching, burning, and pricking commonly present.

In old and long-standing cases, in which there is only comparatively little inflammation, the form of eczema is dry, and there are scales which must be detached, quite frequent washing will be imperative. The selection of soaps need not then be an important matter, for even those employed in the laundry could scarcely be too strong. Indeed, in such cases highly alkaline soaps are generally best. Or common washing-soda might often be used to advantage, one tablespoonful being dissolved in a pailful of water.

Simplifying this rule as to washing, after it has been done once for the purpose of cleanliness, thereafter, in moist eczema, soap and water ought not be applied; but in the dry, crusted or scaly forms of the disease, frequent washing, soap being used, is, as a rule, necessary, and a very important part of the essential treatment.

ECZEMA.

Itching is quite the most obstinate symptom in eczema, and requires energetic treatment. A very potent remedy with the writer is a mixture of Canada balsam and carbolic acid. The crystals of the latter should first be dissolved, and then added to an equal quantity of the balsam, — by measurement, — and the whole warmed, that it may mix well.

This preparation is to be used very sparingly; and to favor convenience it should be in a bottle having a wide neck. The danger from absorption of the carbolic acid is not great; but still it would never be wise to touch with it within a short time a spot larger than the palm of the hand, or several spots that would together be of greater size.

Assuming that a dog has several small spots of eczema, or one spot not larger than the palm of the hand, if the hair is long it should be carefully drawn aside. The bottle should be inverted for a moment, and then turned upright again. That part of the cork to which the mixture has attached itself should be immediately pressed against the inflamed skin, or passed lightly over it, and at once there will appear a film or very thin whitish coating on the surface touched. Repeating this operation if necessary, and having thus treated the affected spot or spots, a powder, like starch or sulphur, should now be dusted on freely, and the hair laid down carefully, if the same is long, to be allowed to mat.

When there are several large spots to be treated, after touching one there should be a delay of an hour or more before another is attacked.

The effect of the balsam and carbolic acid is very pronounced, and in many instances only one application is required, the itching being entirely stopped; but now and then it returns after a few hours; if so, however, the mixture can be again applied, and but rarely will a third touching be needed. If this treatment be effectual, the matted hair ought not be disturbed for four or five days, when it should be well soaked with oil or lard, and gently bathed; and unless it is necessary to use the balsam and acid again, sulphur and lard, vaselin, or other simple ointment may be applied until a cure is complete.

This preparation of balsam and carbolic acid recommends itself not only because it instantly stops itching, but for the reason that in many cases, if it is used early, the hair over the affected spot will not come out. Nor is it absolutely necessary to clip the same before an application is made; which fact is highly important when the season of bench shows is near.

Scratching and biting certain spots are generally the first symptoms of eczema that attract attention. As they are quite as pronounced in sarcoptic mange and fleas, the troubles with which this disease is likely to be confounded, some study may be necessary to clearly determine their cause and the true nature of the attacks.

When fleas excite those symptoms, the fact can be easily and speedily fixed. Although the skin may be torn and broken, it is not much inflamed, nor are

other signs of eczema present. Moreover, when due to these pests, instead of the itching, scratching, and biting being confined to a few spots, they are generally over all hairy parts.

To distinguish between eczema and sarcoptic mange ought not to be difficult for there are a number of distinct peculiarities. The former disease generally matures fairly slowly. That is, a dog is seen biting certain parts, and on examination the skin there is found more or less inflamed, reddened, and slightly swollen, and likely covered with small blisters or pimples; or it may seem raw, or even be covered with thin scales. Now, such spots at first are but few in number, and usually small. They increase and grow larger, however, but not very rapidly, and it may be several weeks before the eruption is extensive.

In mange, on the other hand, the itching, scratching, and biting are more general, — not confined to certain spots; moreover, on examination there appears on the skin of the affected parts a number of pimples or slight elevations resembling flea-bites, caused by the burrowing of the mange parasite. From these there may be a slight discharge, but it dries quickly and forms small crusts. Although the scratching and biting induced in mange break and tear the skin and cause sores, in that disease alone there is much less inflammation than in eczema; while the latter has many other notable peculiarities. Notwithstanding the hair comes out in both affections, the loss is greatest and most rapid in mange. Finally, even were it difficult to distinguish between these two affections from the appearance of the eruption, symptoms, etc., by experimental treatment all doubts could be soon dispelled. The means to be employed is the simple ointment composed of sulphur and lard. That applied to the trouble mange, a gain would be at once apparent, and cure speedily completed. If, however, the disease was eczema of quite severe type, and the ointment had any appreciable effect, the improvement would be neither marked nor rapid.

Returning to the discussion of the local treatment of eczema, again it is urged that while the skin is much inflamed all applications ought to be soothing, and if there is much oozing from the surface they should be in the form of powders, and the same tend to allay the inflammation as well as dry up the discharge.

The mixture of balsam and carbolic acid can be safely applied to all itching surfaces, and much may be expected from it in cases in which the eruption is limited to a few spots; if, however, that is very extensive, as previously stated, the mixture can scarcely be recommended, since its use must be gradual and a long time be occupied in applying it to all parts. But it ought to have an important place in the medicine outfits of those who exhibit dogs, and especially large breeds; for spots of eczema are singularly liable to appear during shows, and by means of this application the trouble can be cut short, and loss of hair and disfigurement prevented. Moreover, that it has been used need not be plainly evident if powders the color of the dog be dusted on. As, for instance, powdered

starch, oxide of zinc, or subnitrate of bismuth would be right for white hair; powdered charcoal for black; sulphur for yellowish; Fuller's earth for brownish, etc. The balsam leaves the surface sticky, to combat which is the purpose of the powder merely, and as long as that is non-irritating and harmless, it matters not what is used.

Raw and oozing surfaces should be kept covered with powdered buckwheat, magnesia, subnitrate of bismuth, the oleate or oxide of zinc, or a mixture of the bismuth or zinc with lycopodium, talc, or starch, in equal parts. Care, however, must be taken to prevent their caking, and thus retaining the accumulating secretions under the crusts they form.

After the oozing has lessened materially, and the surface is comparatively dry, instead of a powder, an ointment composed as follows can be freely applied:

Oxide of zinc, one drachm; powdered sulphur, one drachm; salicylic acid, twelve grains; vaselin, two ounces.

Now and then, but only rarely however, are encountered cases in which the oxide of zinc does not act quite favorably; in which event the subnitrate of bismuth should be substituted in the ointment just described.

If this ointment does not speedily lessen the inflammation, let it be discontinued for a time, and the following lotion applied several times daily:

Goulard's extract of lead, four drachms; laudanum, four drachms; water, one pint.

Or if this does not act well, what is known as "black wash" may be tried for a week, and then a return made to the ointment last recommended.

Where the patient is a pet and kept in the house, for obvious reasons ointments are objectionable; so, too, is the "black wash," and a lotion composed as follows is advised:

Oxide of zinc, four drachms; glycerin, four drachms; rose-water, eight ounces. To be well shaken before being used.

Another lotion having similar effect, and which can be employed in the same class of cases, is the following:

Prepared chalk, two ounces; lime-water, eight ounces. Shake well.

Still another lotion likely to act well after the oozing has lessened and the affected surface is comparatively dry, is made as follows:

Oxide of zinc, one-half an ounce; glycerin, two drachms; dilute solution of the subacetate of lead, one ounce; lime-water, seven ounces. Shake well.

The foregoing ointments and lotions tend to lessen the itching, but often it is so violent, applications must be chosen for the special purpose of overcoming it.

Where the skin is inflamed but not raw, and there is not much oozing, it should be kept well covered with the following:

Menthol, one drachm; oxide of zinc ointment and vaselin, each one ounce.

When the itching is severe and the surface raw and oozing, the following is appropriate:

Camphor and hydrate of chloral, of each one drachm, rubbed together until they are liquefied ; after which they should be added to and rubbed up with one ounce of starch powder. This should be dusted onto the inflamed surfaces.

Under similar conditions of the surface the following mixture promptly relieves the itching, but it is quite expensive :

Muriate of cocaine, one drachm ; glycerin, one drachm ; lime-water, one ounce ; water, three ounces.

This lotion should be applied with a small sponge or a camel's-hair brush ; and as soon as it has dried, there should be dusted onto the affected parts the oxide or oleate of zinc powder, or the subnitrate of bismuth.

A less costly lotion that will combat itching, and one that is sometimes quite as efficacious, is the following :

Carbolic acid, fifteen grains ; chloral hydrate, one drachm ; water, two ounces.

This should also be applied with small sponge or brush ; and onto the surface, which has been allowed to dry, be dusted the oxide or oleate of zinc.

Another lotion, to be used in like manner and followed by the same dusting powder, is thus composed :

Sulphate of morphine, eight grains ; carbolic acid, twenty grains ; water, four ounces.

The itching being intense and the surface not very red and inflamed, it being also comparatively dry, — not much oozing from it, — the following ointment will often prove effectual :

Precipitated sulphur and liquid pitch, of each one-half a drachm ; oxide of zinc ointment, one ounce. Of this a little should be frequently rubbed into the affected skin with gentle force.

When the severely itching eczema is limited to a few not very large patches, and the discharge from the surface is not profuse, the following pigment constitutes a convenient and valuable application :

Oil of cade, one drachm ; collodion, one ounce. At the bottom of the cork a camel's-hair brush should be inserted, so as to be withdrawn with it. The bottle must not be kept open longer than is absolutely necessary. The diseased skin should be coated with this mixture, the application being made as quickly as possible. In drying, it forms a thin film. If that does not appear to be complete, after waiting ten minutes for the first coating to dry, a second may be put on. It will generally be necessary to apply the pigment twice or three times daily, as the film becomes detached. Before the applications, in so far as possible all loosened parts of previous coatings should be gently removed. Invariably also the surface to be treated should be dried if necessary by pressing with soft cloths, otherwise the pigment would not attach itself.

When the eruption is of pimples or festers, the itching seems most intolerable, but it may be controlled by the following lotion ; which, however, cannot be used

if the surface is denuded or has been torn or broken by scratching or biting; that is, the lotion is irritating, and would be too painful were the skin off:

Menthol, two drachms; alcohol, three ounces.

In cases in which it can properly be used, it may be applied as often as the itching becomes violent. Care must be taken that it does not get into the eyes of the patient or user, and lest they be touched by the fingers applying it before they have been thoroughly washed.

Where the eruption is mainly of papules, and there are not very many of them, generally they will disappear much quicker if they are lightly painted every third day with a solution composed of equal parts of pure carbolic acid, hydrate of chloral and tincture of iodine.

Eczema is so rebellious at times and so persistently resists treatment, the reader should be fortified with quite a number of different applications, which he can try in turn if one does not act well; remembering always that seldom can a case of eczema be cured by a single means alone, and different ones must be used, according to the various causes and existing conditions.

An agent of great worth, and only rarely appreciated in the treatment of skin diseases, is common whale-oil that has been properly refined. It not only speedily renders the skin soft, smooth, flexible and elastic, but being of lower specific gravity, penetrates more easily and deeply, and is absorbed with greater rapidity than any other animal oil. As a medium for the conveyance of medicines into the skin, it is therefore of exceeding value; and when combined with an equal part of chloroform, as an anæsthetic it acts almost immediately, also very efficiently, upon the ends of the nerves that lie near the surface. This combination therefore constitutes an admirable application in cases of superficial pain, and in skin affections attended by itching, tenderness or soreness. Moreover, it has the superior advantage of being non-poisonous; and even if the patient laps it, which is unlikely, it could not do him any harm.

Whale-oil, or if that is not easily obtainable, cod-liver oil, may be advantageously combined as follows, in many cases:

Whale-oil, one quart; oil of tar, one pint; oil of turpentine, two ounces; lac sulphur, sufficient to make the mixture fill a two-quart measure.

The most suitable cases for its use are those in which the eruption is of dry form. One application often suffices if made to all hairy parts. That done faithfully, the patient should be confined for about four days, on clean straw, then thoroughly washed, soap being used in the operation.

If this oily preparation appears to act well it can wisely be employed every four or five days until a cure is effected, or a gain is no longer occurring.

An ointment which tends to allay itching, and may be used quite freely where the skin is off, is the following:

Sulphate of morphine, four grains; powdered camphor, one drachm; oxide of zinc ointment, two ounces.

Another preparation which tends to allay intense itching, and is especially adapted to house pets, is composed as follows :

Brandy, one hundred parts ; glycerin, fifteen parts ; cologne water, fifteen parts ; tincture of benzoin, five parts ; salicylic acid, two parts ; menthol, one part.

If the skin is broken, after this has been applied the following should be freely dusted onto the surface :

Rice powder, forty parts ; talcum powder, twenty parts ; oleate of zinc, ten parts ; subnitrate of bismuth, five parts. .

The balsam Peru is a remedy which has for years been much used in skin diseases, and generally proved efficacious, although disappointing now and then. It is best adapted to chronic eczema, but still is often of value in acute and recent cases, therefore might be given a trial in the following combination :

Balsam Peru, one ounce ; alcohol, one ounce ; oxide of zinc, two drachms ; glycerin, three ounces. This can be applied, with a soft brush, twice daily.

The same balsam may also be freely used, to great advantage in many cases, combined with sulphur, as follows :

Balsam Peru, one ounce ; powdered sulphur, three drachms ; alcohol, one ounce ; glycerin, one ounce ; water, three ounces.

Or the balsam may be used with sulphur in ointment form, there being one ounce of each rubbed up with six ounces of vaselin or lard.

If doubt exists as to whether a case is an eczema merely or one of sarcopitic mange, this ointment would be admirable, since quite as active in one disease as in the other.

An application which is often successful in the early stages of eczema, and can be applied quite freely, several times daily, is the following :

Salicylic acid, twenty grains ; oxide of zinc, two drachms ; powdered starch, two drachms ; petrolatum, four drachms.

Another application which usually acts exceedingly well is made as follows :

Lead plaster, one ounce ; carbolic acid, twenty grains ; olive-oil, five ounces. To be applied twice daily.

For use on house pets carbolic acid is objectionable to many because of its odor. Thymol can be employed instead, as follows :

Thymol, three drachms ; starch and oxide of zinc, of each six and one-half drachms ; lanolin, one and one-half ounces. This salve may be freely applied to the affected parts.

Resorcin is another popular substitute for carbolic acid, on account of absence of odor and danger of poisoning, and it generally proves highly efficacious in eczema when combined as follows :

Resorcin, sixty grains ; carbonate of lead, eighty grains ; diachylon ointment, four ounces.

This should be used twice daily.

Eczema that has existed for several weeks and become chronic requires somewhat different treatment than it did in the early stages, because of the changed conditions. Inflammation persists, but it is scarcely so active and severe. Scabs, crusts or scales continually form, fall off, and are renewed; fissures or cracks occur in the skin; the disease spreads and appears in different stages in different parts; the skin, still tender, is thickened, dry, and hard; the hair falls out; and the itching continues, although it may not be quite as intolerable as at the beginning.

The first indication is to uncover the skin so that the remedies may reach it, and to that end the crusts must be softened and removed.

For this purpose fresh lard, whale, linseed, olive, or cod-liver oil, or vaselin may generally be used. Or if the crusts are very hard and horny, a five per cent solution of salicylic acid in castor-oil should be applied.

The remedy chosen for removing the crusts must be vigorously rubbed in several times daily, in generous quantities, that they may soften and crumble. Twenty-four hours at least, and possibly several days, will be required to render them easily detachable. When so, there should be a thorough washing with soap and hot water. As to the kind of soap to be chosen, it may be carbolic, sulphur or glycerin, if the skin is yet tender and sensitive. If, however, it is thick, dry, and hard, and there is not much active inflammation, the green soap kept on sale in drug stores, tar soap, or even the soft soap of the kitchen, may be employed; and strong soaps are best always if the skin is much thickened, for they help remove the morbid products that caused the thickening.

After the crusts are off and the surface is clean, a good application is linseed-oil if the affected parts are kept well lubricated with it. That failing to effect a gain, a mixture of the oil of cade and olive-oil, in equal parts, should be tried.

Another application which very generally acts well is the following:

Tar, one ounce; powdered sulphur, one ounce; green soap and lard, of each two ounces.

This should be freely and vigorously applied twice daily unless it increases the inflammation. In which event it should be thoroughly washed off, and for a few days some such simple ointment as sulphur and lard, vaselin, or the oxide of zinc ointment, employed; after which it should be again tried. Or instead of the simple ointments advised some preparation of lead might be used; and one of the most serviceable is made by mixing diachylon plaster with linseed-oil, in equal parts. This may be applied freely several times daily.

Itching is quite sure to continue, more or less severe, throughout every attack of eczema, until a cure is complete; but it may be expected to subside somewhat as improvement occurs. If after the crusts have been removed it

requires special treatment, the preparation in use might be stopped for a short time and the following be applied sparingly :

Carbolic acid, one drachm ; oxide of zinc ointment, two ounces.

Or the ointment composed of morphine, camphor and oxide of zinc ointment, recommended in the foregoing, might be tried.

The mixture of whale-oil and chloroform, previously advised, could be used after the surface was free of crusts ; but since it is thin and very volatile, it would be advisable to thicken it to the consistency of ointments. For this purpose wax should be chosen, and the proportion of it be about one-fourth.

Still another ointment that usually controls itching, especially in cases of eczema of long standing, is the following :

Oxide of zinc ointment and compound ointment of subacetate of lead, of each half an ounce ; chloral hydrate and powdered camphor, of each fifteen grains ; powdered sulphur, one drachm ; pineoline, two ounces. This to be rubbed in well, morning and night.

Strangely, perhaps, some cases of chronic eczema have done well under the application of male fern after they have resisted other remedies. It is used as follows :

Alcoholic tincture of male fern, one ounce ; alcohol, half an ounce ; tincture of myrrh, one drachm ; balsam Peru, three drachms.

This is very strong, and the only cases in which it should be tried are those in which the eruption is of small extent, very dry form, and the affected surface is covered with crusts. The latter should first be removed by washing, green soap or ordinary soft soap being used, and the mixture then be lightly rubbed in. It irritates considerably at first, but, as a rule, only a little, if any, after a few days. If likely to have good effect, a gain would be noticeable in the course of a week.

In occasional cases, and especially of dogs kept in houses, the tarry preparations, and indeed all ointments, would be decidedly objectionable, therefore lotions must be used, and the following is recommended :

Carbolic acid, two drachms ; alcohol and glycerin, each one ounce ; water, six ounces. This may be applied with brush or sponge : and it is generally quite serviceable in the scaly form of eczema.

A more agreeable preparation for use on house pets suffering from dry forms of eczema is composed as follows :

Compound tincture of benzoin, one drachm ; alcohol, one ounce and one-half ; water, three drachms ; glycerin, six drachms. It should be applied to the affected surfaces, twice daily, after the same have been washed with soap and water, and carefully dried.

Where the affected dog is kept in kennels, and his owner cannot devote much time to him and apply ointments as often as required, it would be well for him to give clear balsam of Peru a trial. It is thick, like syrup or honey,

and should be put on with a brush, after being warmed; and generally one application daily will suffice. It must not, however, be used except on surfaces from which the hairs have fallen or been clipped, because it would hopelessly tangle and mat them together.

Where the eczematous spots are so located that the dog cannot bite them, a mixture of equal parts of the ointment of white precipitate and simple ointment acts favorably. This is especially adapted to scaly eruptions around the eyes and ears.

Another ointment serviceable in like eruptions in those parts, also where the eczematous sores have healed and the skin has been left scaly, — provided the dog cannot reach the spots with his mouth, — is the officinal ointment of red oxide of mercury.

From the large number of preparations described in the foregoing, one or more to hit every case ought to be found.

Summarizing briefly, during the early stages of eczema, and while there is much inflammation of the skin, the applications should be mild and soothing.

As long as there is much oozing, powders are indicated, ointments or lotions being of but little if any benefit.

Crusts or scabs must always be first removed, because medicines cannot penetrate them and affect the parts beneath. This having been done, if there is much inflammation where they were located, soothing applications should be made for a time, as in an early stage; and the inflammation having subsided, one of the stimulating preparations which contain the oil of cade, tar, or some like-acting agent should be applied.

The fact deserves repetition, for the sake of emphasis, that seldom can a case be cured by one means alone; indeed, oftentimes several must be used. Moreover, a measure that has acted well in many cases may be worthless in the next, and it be necessary to try two or three, or more, preparations before one is found that is adapted. Another important fact is, that frequently different parts of the body or limbs require very different treatment, — thus in one instance with a soothing application, another with a preparation of tar, still another with an absorbing powder; and so on, according to the various conditions.

Here it is well to draw attention to the fact that, as a rule, for use on long-haired dogs, lotions are to be preferred to ointments, especially if the latter contain tar or resin of any kind, since they cause the hair to become matted together, and thus add to the difficulties of treatment.

Another quite important fact can properly be stated here, namely, that one great secret in curing skin diseases, also in healing wounds, lies in making the applications often enough to keep the inflamed parts soft and slightly moist, — not allowing them to become dry and somewhat hard, as they must generally be if left to themselves.

Before passing from the local to the internal treatment, a few words as to the removal of the hair in eczema. If it is not disturbed and the disease persists, it is quite sure to fall out, therefore as a rule it is advisable to closely cut it over every eczematous spot, for there is then a probability of the hair remaining fixed at the roots; when of course it would be renewed much quicker than if it fell out. However, if the spots were small and the disease limited to but a few of them, one might be justified in trying to cure without interfering with the hair.

A fact of special interest in this connection is, that often when dogs are under treatment for eczema their hair comes out, not only in the sore spots but in unaffected places; or in other words, the loss is quite general, and it persists until the entire surface is nearly bare. This is usually attributed to the disease, but as a rule, if not invariably, the victims are taking large doses of arsenic, and that drug is the cause of the loss beyond the eruptive spots.

While attacks of eczema can be produced by external causes alone, as scratching and biting in consequence of the itching excited by fleas or parasites, in much the largest proportion of severe cases the causes are within the body.

Generally if the eczematous spots are few in number and not large, and although present for a week or longer they have not spread much, it is reasonably safe to assume that they are due to external causes; whereas if they are quite numerous, located on various parts of the body, and especially the head and legs, and the eruption is extending, then the chances are nearly all in favor of the causes being internal. But even if the indications are that an eczema is due to external causes purely, the victim must be carefully studied, every fault in management be corrected, and his health improved as much as possible; the fact being kept in mind that the discomfort caused by the eruption must necessarily be more or less depressing and weakening, and tend to lower the tone of the general system. Therefore, even if a dog seems perfectly well aside from the eczema, unusual efforts should be made to keep him so, for the better his health the less troublesome will be his disease.

Were they invariably properly chosen, doubtless a cure could be effected in every case by means of external applications alone. But happy selections always are too much to expect even from physicians; moreover, by the aid of tonics, better management, etc., recovery ought to be far more rapid. Therefore internal treatment is advised in all cases in which the health of the patients might be improved, as well as in those in which the causes are evidently internal.

The general and internal treatment should be adjusted to individual peculiarities, and designed to overcome, in so far as possible, all existing faults which may be productive of disease or derangement, or which may encourage, as it were, such defects to persist if they have been induced by, and are solely due to, other causes. For instance, if the victim has been overfed, certain

special modifications in feeding will be absolutely necessary; so, also, if he shows that his diet has been scanty. Again, a dog confined most of the time to kennels should be treated somewhat differently than another allowed much liberty.

When the fault is overfeeding, the blood is so generally what may be termed inflammable, an effort should be made to cool it by means of the following:

Sulphate of magnesia, one ounce; sulphate of iron, one drachm; aromatic sulphuric acid, four drachms; water, six ounces.

A medium dose is one teaspoonful, three times daily, between meals.

Besides administering this, some changes in the diet should be made, and foods be chosen that are not stimulating, as boiled rice, milk, vegetables, etc. More exercise must also be allowed if, as commonly the case in over-feeding, it has not been sufficient.

Were the sulphate of magnesia given alone for considerable length of time, even in small doses, it would likely weaken the patient, therefore the sulphate of iron has been combined with it in the foregoing formula to prevent such ill effect.

The mixture in question is not only cooling but improves the tone of the blood; hence in all cases in which the patients seem otherwise healthy yet the eczema is obstinate, it can be safely tried, with the assurance that it cannot do any harm if it fails to do good.

If the patient be thin, under weight, and evidently poorly nourished, from one to four teaspoonfuls of cod-liver oil, three times daily, will be indicated. At the same time a more generous diet, into which animal foods enter largely, ought to be allowed; and the meats may be given either cooked or raw.

In anæmia or poverty of the blood, characterized by pale lips and tongue, a tonic is demanded; and the citrate of quinine and iron suggests itself. This should be in the form of pills, each containing from two to five grains, according to the size of the patient; and one be given three times daily. Here again a diet of meat in generous quantity is imperative.

Dogs that are fed largely on meat, and appear unusually robust, are often too full blooded, and need pulling down a little if there is much inflammation of the skin; and to such it is advisable to give from one-quarter to one-half a teaspoonful of Epsom salts, according to the size of the patient, once daily, at noon, for about a week; when this remedy should be discontinued for a few days, and then returned to if necessary. At the same time some change should be made in the diet; and instead of so much meat, rice, bread, milk, and vegetables should be allowed.

In analyzing the conditions of a dog for the purpose of settling upon the treatment to be employed, the age should be duly considered, the fact being in sight always that the reparative powers are greater in the young than in the old; and where the former might recover from attacks of equal severity

without any internal medicines, the latter would generally require potent remedies.

In all cases of eczema in which the presence of worms is suspected, a vermifuge should be given, and other internal medicines be withheld for a short time, until it is clear that a cure is not likely to take place without them.

In a large proportion of cases of eczema the patients are victims of indigestion of quite long standing. Where the skin disease seems due to this cause, manifestly all errors in diet must be corrected, and only simple and easily digestible foods allowed. This salutary change instituted, the stomach trouble will often disappear without the use of medicines; but if it persists, there should be obtained pills, each of which contains about two grains of pure pepsin and one-fourth of a grain of the extract of *nux vomica*; and one of them be administered twice daily, after eating.

This pill is right for medium size breeds. For the largest it may be one-half stronger; for dogs about the size of fox-terriers it were best to have it contain one grain of pepsin and one-eighth of a grain of *nux vomica*; while for toys, the quantity of pepsin may be the same, but the *nux vomica*, at least at first, ought not to exceed one-sixteenth of a grain.

Exercise is the grand eliminator of waste, and unless sufficient be allowed, the system is quite sure to become choked with poisonous matter that should have been expelled. In such cases the liver is generally torpid and sluggish, as indicated by bad breath, coated tongue, and disinclination to active movement; or, as commonly expressed, the dog is dumpish.

When this condition exists, or is even strongly suspected, it is advisable to stop all other internal treatment for from two to six days, and give pills composed as follows:

Blue mass, four grains; powdered ipecac, one grain; extract of dandelion, thirty grains.

From this mixture twelve pills should be made if the dog be of medium or largest size breed, and one pill be given three times daily. For all dogs of smaller breeds the same number of pills might be made, but only one-half of the quantities of the various ingredients advised should be put into them; and it would scarcely be wise to give them to such for more than two or three days.

The medicine most frequently resorted to in eczema is arsenic, and undoubtedly many times it is used indiscriminately and when not required. It certainly has proved of value in some cases of the chronic form of the disease, but simpler remedies would often do quite as well, and should always be tried first.

It is but rarely, if ever, indicated in moist skin diseases, for they are generally made worse by it. Therefore it cannot often be resorted to in acute eczema, because the eruption is seldom dry. Nor can it rightly be adminis-

tered in any case of quite *recent occurrence* in which the skin affection is evidently attributable to errors in digestion, until after every effort has been made without success to overcome them. But in *long standing cases*, in which digestion is not perfect, arsenic combined with a tonic will likely prove beneficial.

Cases are now and then encountered in which the caretaker is in doubt as to whether he should give arsenic or rely on some other internal remedy, the subjects being seemingly well nourished and in fairly good health, aside from the skin trouble.

Sublimed sulphur is the ag [†]t which can rightly be first tried in such cases. The dose should be small, and for dogs of medium size, about the quantity that can be taken up on a silver dime. One-half more for dogs of largest size, and one-half less for fox-terriers, and the like; while toys may take about one-fourth the quantity proper for those of medium size.

This powder should be mixed with the food for breakfast, and may be given daily for two or three months.

In cases of long standing that have resisted all other treatment, arsenic may be tried in the following combination :

Citrate of iron and ammonia, one ounce; Fowler's solution, two ounces.

Of this four drops may be given three times daily, in the food, to dogs of medium size breeds; six drops to the largest; three drops to those of about the size of fox-terriers; and two drops to toys. Slight increases in the doses may be made from time to time if a gain is not occurring.

For a time after an eruption of eczema has disappeared, the use of the applications which have been successfully employed should be persisted in, lest the trouble recur.

If a thickening of the skin remains, and the patient cannot lap the spots, a little of the ammoniated mercury ointment should be rubbed in every night and morning; or petrolatum can be used if it is easy for him to reach those spots with his mouth.

As for remedies to make the hair grow after healing is complete, only a few of the most popular are likely to have any effect, while some are positively inert. If the denuded skin be kept softened by a simple ointment, a renewal of the hair will be favored. To stimulate its growth, the following will doubtless accomplish quite as much as any other preparation :

Resorcin, one drachm; salicylic acid, two drachms; alcohol, two drachms; castor-oil, two ounces.

Once daily it should be well rubbed into the skin from which the hair has fallen.

CHAPTER II.

SARCOPTIC MANGE.

SARCOPTIC mange is an affection of the skin produced primarily by a minute insect called the *Sarcoptes Canis*. This provokes a characteristic eruption, also severe itching, which causes the victim to scratch and bite, and in consequence an artificial eczema is developed.

This insect, the acarus, an animal parasite, is supported by nourishment that it draws from the skin. The male is much the smaller, and remains in short burrows or vesicles, while the female tunnels the skin in long canals.

The course of the latter is to seek a furrow on the skin, to which she attaches herself, and by means of her jaws penetrates the outer layer or cuticle, and continues on until she reaches the deeper and softer layers, where she finds nourishment. She then proceeds to burrow and lay her eggs, with which she blocks behind her the passage that she has made.

A young acarus develops from an egg in about two weeks. The number of eggs usually laid by a female is about sixty, and this production goes on continually until she dies, which is generally in the third or fourth month.

Around the furrows there appear pimples or slight elevations resembling flea-bites. These generally change to vesicles, but sometimes to pustules, when they discharge a small quantity of bloody pus, which, drying, produces thick dark crusts.

In consequence of the scratching induced by the itching, the furrows are opened and the acari set free. The original eruption then gives place to eczema, with the irritation and itching that invariably attend it; and that disease spreads and increases in intensity.

As soon as out, the young acari run about on the surface, bore quickly beneath it, and in doing so add to the intolerable itching.

After an extensive eczema has been developed, the presence of mange might be completely disguised; but in the early stages of the latter it ought not to be difficult to determine the true nature of an attack.

In sarcoptic mange the vesicles occur singly, not in groups, as in eczema; and they are pointed, not flat or rounded, like those of the latter disease.

Itching is very severe both in mange and eczema, and intensified where these affections are combined; but in cases of the former there are times when it is scarcely noticeable, whereas in the latter it is always very troublesome.

For instance, with a dog suffering from eczema, it is scratch, scratch, under all conditions; but the victim of mange finds relief when in the cold open air; then let him be taken into the house and allowed to lay for a short time near a stove, and the itching nearly drives him frantic.

While the real cause of sarcoptic mange is a parasite, uncleanliness certainly favors the same, and this fact should be in mind when treatment is undertaken. If satisfied that a dog is harboring the acari, he should be at once removed from his kennel, his bedding burned, and hot lime, generously impregnated with carbolic acid, plentifully used in every part, crack and crevice of his building. Thereafter, if he goes back to that kennel, the disinfectant process should be repeated as often as once each week until he has completely recovered.

In instituting treatment, those remedies should be chosen which not only destroy the parasites and their eggs and cause the eruption they produce to disappear, but cure the eczema which the scratching has given rise to.

Sulphur is the sovereign remedy, and it may be combined with other medicinal agents as the conditions indicate.

The first step should be to wash thoroughly in strong suds made of carbolic soap; and rinse the same off quickly with lukewarm water.

In mange, sulphur is very generally used with lard, in the proportion of one part of the former to four of the latter; and certainly this is quite the best form. It is possible, however, for sulphur to act well alone if the dry powder be faithfully rubbed into the hair over all parts of the body. But still it would scarcely be advisable to use it dry except on house-pets; and even in such cases the ointment should be promptly resorted to, and rubbed in twice daily, if with the powder a gain is not speedily apparent.

A mixture that will immediately destroy the mange parasite is composed as follows:

Carbonate of potassium, one ounce; powdered sulphur, two ounces; glycerin, six ounces.

Another quite potent destroyer is the following mixture:

Sperm-oil and oil of tar, of each ten drachms; and sulphocarbonate of sodium, one drachm. This should be applied warm, and for one or two hours the dog under treatment should be kept in a warm room. In the course of forty-eight hours let it be applied the second time. Allow it to remain on until the fifth or sixth day, and then wash the patient thoroughly, using soap quite liberally. If it be evident that a cure has not been effected, it will be advisable to try one of the other preparations herein recommended.

The simple ointment of sulphur and lard is somewhat stimulating, and now and then proves irritating, and increases the inflammation of the skin. In which event the following is advisable:

Balsam Peru, two ounces; powdered sulphur, one ounce; vaselin, two ounces.

In preparations designed for application in sarcoptic mange the sublimed sulphur, known also as the flowers of sulphur, is sometimes used. This is scarcely more than powdered brimstone, and the product of sublimation of crude or rough sulphur. Precipitated sulphur, or as generally termed the milk of sulphur, is a purer form of sulphur, and that commonly chosen by druggists when simply powdered sulphur is designated. The so-called liver of sulphur, of liver-brown color, is the sulphurated potassa, consisting of sublimed sulphur, one part, and carbonate of potassium, two parts. This is much stronger than sulphur proper, and when applied to the skin too freely is quite likely to cause irritation, and possibly inflammation. It is even more destructive to the mange insect than sulphur alone, and may be used if eczema has not been set up, or the skin much wounded by biting or scratching.

An inexpensive and very efficacious preparation may be made as follows :

Lard oil, one pint ; finely powdered liver of sulphur, two ounces ; oil of tar, two ounces.

Mix its ingredients thoroughly ; and rub this well into the skin. Until it has dried on, the patient must be kept warm and out of draughts. Repeat the application in two days, taking the same precautions against cold. Then, in the course of a day, wash well, using a strong soap, and completely dry the coat with towels.

In every case supposed to be of mange, while a dog is under treatment, his bedding having been first burned, his kennel should be thoroughly disinfected by means of corrosive sublimate solution, 1 to 3,000, or carbolic acid, burning sulphur, or the like.

Naphthol is also a bitter enemy to the mange parasite, and may be applied with vaselin, two drachms of the former to three ounces of the latter. Or if the trouble has existed for several weeks, and the skin is considerably thickened without being greatly inflamed, the following would be better :

Naphthol, three drachms ; green soap, one ounce ; lard, three ounces.

In the following ointment four of the most potent parasitocides are combined :

Beta-naphthol, one drachm ; precipitated sulphur, two drachms ; storax and powdered pyrethrum, of each six drachms ; lard, three ounces.

An agreeable preparation which is in some degree destructive to the mange insect, and might possibly prove effectual in mild cases of only recent occurrence, is the tincture of benzoin. On toys and small pets, with which, for obvious reasons, only a limited number of remedies can be used without rendering them so objectionable that they must be excluded from the living-rooms, this might be tried, and applied with free hand twice daily ; but unless a decided gain were appreciable in the course of three or four days, a more powerful agent should employed.

Where ointments are used they should be rubbed in vigorously and freely twice daily, for two days, the applications being made to all parts, and even to

those that appear unaffected. That is, the head, tail, and legs should be as faithfully treated as the body, that every parasite may be destroyed.

Ointments having been applied, at the end of the second day the patient should be washed thoroughly, and thereafter his case be treated as one of eczema, the remedies appropriate for that disease being used. But preference should be given to the lotions in which the principal constituents are Goulard's extract of lead and the oxide of zinc, because on eczema that is associated with mange they have a better effect than ointments.

If, now, under proper treatment for eczema, in a week a cure is not being effected, it may be assumed that all the parasites were not killed, and agents destructive to them should be again used for two days, then washed off, as in the first instance, and the treatment for eczema returned to.

Of the foregoing ointments, that composed of naphthol, green soap, and lard not only promptly kills the parasite, but as a rule causes the least irritation, lessens or altogether stops the itching, has a healing effect upon the eczema, and leaves the skin in good condition. But notwithstanding this, cases may be encountered now and then in which one of the other ointments will do better work.

A lotion very often resorted to in mange and suspected cases is prepared as follows:

Powdered sulphur, two ounces; unslaked lime, one pound; water, two gallons. Mix thoroughly, and boil down to about five quarts. Let the mixture stand and settle for three or four hours; then pour off the clear fluid.

This may be applied by means of a sponge; and if the patient is a house-pet, it would be preferable to either of the ointments. But it is quite strong, and the skins of some dogs are naturally so sensitive that they cannot bear it, quite severe inflammation being set up; and occasionally the legs are made to swell. Again, it is liable to harden the breasts and nipples, therefore for bitches it cannot be recommended, especially if they are with pup. In many cases also, in consequence of scratching or biting, the skin is much broken or torn, or there is severe eczema, and were this lotion used, the effect must be painful as well as very irritating.

Evidently, therefore, this remedy, which, by the way, is described herein largely because of its popularity, must be used cautiously and with nice discrimination. The coat and skin should be wet with it, but not drenched, nor ought much be left to dry on; and in the cases in which it promises to be too irritating, some other preparation should be chosen. Furthermore, all who apply it should either well oil their hands or wear rubber gloves, because of its liability to irritate the skin around the nails.

To be instantly destructive to the mange insect a larger proportion of lime would be necessary, and the preparation be made as follows:

Put three ounces of powdered sulphur and six ounces of quicklime into one

quart of water, and boil together for ten or fifteen minutes; then stand aside to cool and settle, and finally pour off the clear fluid.

Before using this it would be advisable to rub the dog all over, for perhaps fifteen minutes, with common soft soap. Then stand him in a tub of tepid water and bathe him for half an hour. The most of the water in his coat having been forced out, the clear solution of sulphur and quicklime should be applied to the hair and skin with a sponge, and all that is on be allowed to remain fifteen or twenty minutes; after which he should be given a general bath, and well washed, from tip to tip.

Of course the objections to this are even greater than to the milder solution, and except with short-haired, strong and hardy dogs, free from eczema and scratches and breaks in the skin, it would scarcely be safe to try it.

A dip that will destroy about every parasite which dogs may harbor can be easily prepared as follows:

Instruct the druggist to put into a pint bottle four ounces of the sulphuret of potassium and about half a pint of water. Then of dilute sulphuric acid add sufficient to render the mixture of neutral reaction, — that is, neither acid nor alkaline, — and afterward fill the bottle with water.

This pint mixture should be poured into a common washing-tub, together with four gallons of water; and it is then ready for use, provided it has been made comfortably warm.

Stand the dog in the tub and drench him thoroughly; then rub lightly with a soft towel. Repeat the operation every morning for three days, in the same dip, first adding boiling water enough to make it about blood warm; and afterward keep him in a warm place until he has dried.

The dip will retain its strength three or four days, and admit of as many applications before its virtues have been spent.

An aqueous solution of the sulphide of lime is speedily destructive to the mange insect. Roughly, it can be made by boiling together for a short time one part of sublimed sulphur, two parts of lime, and ten of water. After being allowed to cool and settle, the clear fluid is poured off and kept in well-stopped bottles. The dog with mange is first given a bath and well washed for half an hour with soap and tepid water, after which his coat and skin are thoroughly wet with this solution, and the same is allowed to remain on and dry for about a quarter of an hour. Then a second bath is administered. If this has been done rightly all the mange insects will have been destroyed, and it will be necessary merely to employ for a time some simple ointment, to overcome any irritation of the skin that remains.

It should be remembered that while sarcoptic mange is purely a local affection, and nowise dependent upon constitutional disturbances, the annoyance caused by itching, the loss of sleep, the effect upon the nervous system, etc., will likely induce derangements, which in turn must result in debility and an

impairment of the general health. Therefore tonics or other appropriate remedies should be administered if required.

FOLLICULAR MANGE.

Follicular mange is a parasitical affection, characterized by disease of the hair-follicles, subsequent inflammation of the adjacent skin and tissues immediately beneath it, and the formation of small blister-like tumors or abscesses.

It is contagious, but far less so than sarcoptic mange. Fortunately cases of it are very rare. While mature dogs are not exempt from the disease, it is confined almost entirely to puppies; and very generally it makes its appearance between the fourth and seventh months.

Earlier authorities, it would seem, were agreed as to the cause of this affection, and in later times, aside from the writer, none have publicly dissented from the theory that the active agent is an animal parasite,—the *acarus folliculorum*. This, however, his experience does not sustain, and he is firm in his belief that instead of follicular mange being produced by an animal parasite, its true cause is a vegetable parasite or fungoid growth; also, that the disease closely resembles the so-called barber's itch in man.

While it is communicable by contact, lack of cleanliness, damp kennels, and general neglect certainly favor the parasite which causes it. In other words, dogs under those influences are more liable to suffer from follicular mange than others well cared for, in clean, dry kennels.

Each hair has a root which is planted in the skin. This presents a bulbous enlargement at its extremity, and is lodged in what is called the hair-follicle. In the disease under consideration the hairs are first affected; then the follicles are inflamed, and the adjacent skin becomes hot, red, and swollen.

Analyzing the eruption of follicular mange, it commonly consists of small swellings, like boils, only a few of which appear at first—scarcely more than two or three. They then slowly increase in number, until eventually the body is literally a solid mass of them.

In the beginning they are firm and hard, and, like commencing boils, feel as shot under the skin. They are then also about as large as buckshot. Gradually they increase in size, and eventually attain about that of filberts; but they do not rise far above the surface. While becoming larger they are softening, and at the same time the skin over them is growing thinner and thinner, until it can be easily ruptured by pressure between the thumbs.

During the time that process is going on a peculiar and characteristic change is taking place in the appearance of the skin over the tumors or swellings, it becoming a purplish red color. This is due to the thinning of the skin, until it is nearly transparent, and the bloody matter beneath, which has the

appearance of the fluid that settles under a severe bruise. Indeed, after the change in question, what first promised to be boils now resemble so-called blood-blisters.

A few of these blister-like enlargements break, and the discharge forms crusts; but none really "come to a head," like boils, and much the largest proportion of them remains unbroken unless interfered with; the skin over them becoming so elastic and stretched that if suddenly punctured with a small lancet the fluid within spurts several feet.

After the hairs are affected they speedily fall out, and if the victim lives he is eventually quite bald. His skin becomes dry; and it cracks, but the fissures are shallow and rarely bleed. He also emits a very offensive odor.

Notwithstanding the seemingly painful character of the eruption, it appears to occasion much less discomfort than one would naturally expect; but the victim is nervous and uneasy, and his very evident dejection would indicate that he realized his condition.

Itching is never a symptom of this disease, and herein it is radically distinct from sarcoptic mange and eczema.

It may attack any portion of the body, but generally it appears first on the head or breast.

As a rule the appetite continues good, and for a time the body remains well nourished; but when the eruption has become extensive, emaciation is rapid, even while the decline in strength is surprisingly slow. The poor dog must then know that his case is desperate, for his spirit is broken; and although he comes when called, he soon slinks back to his kennel, bearing every indication of utter despondency.

Unless sacrificed, he slowly wears away.

Although this disease may appear in slightly changed form, but rarely is it encountered except as described in the foregoing.

Follicular mange is a curable disease, but only under the most favorable conditions.

Indeed, it is so discouraging, attempts at treatment cannot be advised excepting in cases in which the eruption is very limited,—to four or five enlargements or tumors,—and the unfortunate is of considerable value.

The parasite, which is the cause, being at the roots of the hair, to reach it with destructive agents is exceedingly difficult, and this is the special reason for the outlook being so very poor always.

The first step in the way of treatment should be to pull out the hairs over the tumors, only one being drawn at a time. These hairs are very generally diseased, which fact renders their removal imperative. Through the minute canals left, there will be some favorable, even if only slight, discharge from the inflamed parts within, and it must be a little easier for the remedies applied to penetrate deeply and reach the parasites.

The hairs having been extracted, the patient should be thoroughly drenched all over with benzin, and this operation repeated twice each week thereafter.

In recent cases, in which the eruption has existed but for a short time and is limited to a few spots, a preparation composed of equal parts of the tincture of iodine, carbolic acid and hydrate of chloral has acted exceedingly well. It penetrates deeply into the tissues of the skin, destroying all parasites and all forms of micro-organisms which it reaches; and if properly used in an early stage, it would almost always, if not invariably, prevent the spread of diseases caused by them, overcome the attendant inflammations, and effect speedy cures. Chronic thickening of the skin left by such inflammations would also quickly disappear under its use; and there is no application which proves as beneficial as this in hastening the return of hair to spots from which it has fallen in consequence of parasitical diseases.

It is therefore advisable to commence treatment of follicular mange, also all doubtful if suspicious cases, with this remedy, and to apply the same, with a camel's-hair brush, to every enlargement or threatening spot. For three days one application daily should be the rule. Thereafter for one week it ought not be applied to the parts that have had three applications, but on every new spot of eruption, or where the eruption seems about to appear, it should be at once conscientiously used.

During the week subsequent to the third application of the iodine solution, the following should be applied, two or three times daily, to and around the spots that have been treated with that solution:

Balsam Peru and alcohol, of each one ounce and one-half; flowers of sulphur, one-half an ounce; glycerin, five ounces.

Whether or not the solution of iodine, carbolic acid and chloral has acted well will be evident at the end of a week, for the suspicious enlargements and spots will either have grown larger and become more inflamed, or have lessened in size and their deep redness greatly faded.

If a gain has been made, unless it is plainly evident that the eruption treated is rapidly disappearing, it will be advisable at the end of the week to again apply the iodine solution once daily for two days; then return to the mixture of balsam Peru, alcohol, sulphur and glycerin; and persist in that until a cure has been effected.

That there may be no mistake, this method of treatment is again briefly defined:

To every pimple, suspicious enlargement or spot, apply the solution of iodine, carbolic acid and chloral every day for three days. Then on the places so treated, instead of this solution, use the mixture of balsam Peru, alcohol, sulphur and glycerin. At the end of a week, unless there has been very great improvement, to the same spots again apply the iodine solution once daily for two days, and, as before, follow it with the balsam Peru mixture.

Treat every new pimple, enlargement or suspicious spot in precisely the same way as soon as detected.

The iodine solution will redden the skin, and in occasional instances inflame it considerably, the effect being literally a burn. That, however, will speedily disappear.

If to follicular mange, or to a doubtful but very suspicious eruption, the iodine solution has been applied for three days, then the balsam of Peru mixture for a week, and again the iodine solution for two days, yet no improvement has been made, but instead the pimples or enlargements have increased in size, the attendant redness is as deep as ever, and new spots of eruption have been appearing from time to time, — all of which show conclusively that the treatment was not effectual, — the iodine solution should now give place to a mixture of Canada balsam and carbolic acid, in equal parts. To every pimple, enlargement or suspicious spot, this should be applied twice daily for two days. No further application of it should be made to the parts so treated, but, instead, on them the mixture of balsam Peru, alcohol, sulphur and glycerin, previously advised, should be used two or three times daily.

At every point at which the eruption is found or threatens to appear, precisely this treatment should be promptly applied.

Whether or not it is proving of value will be evident at the end of a week, when, if it has acted well, the enlargements first treated will have begun to grow smaller, and the deep redness have faded considerably.

If a gain is being made, the same treatment should be persisted in; and the hope of a cure in time can be reasonably indulged. If, however, the enlargements are increasing in size, growing more numerous, and passing through the characteristic changes peculiar to the disease, as described in the foregoing, the following should be tried in conjunction with the balsam of Peru, alcohol, sulphur and glycerin:

Creosote, one-half ounce; olive-oil, three and one-half ounces; solution of potassa, one ounce.

The first two ingredients should be well mixed by vigorous shaking; after which the potassa may be added.

This should be applied, with a brush, to all diseased parts every fourth day, and meanwhile the use of the balsam Peru mixture be persisted in, two or three times daily, as before.

If this treatment also fails, a physician should be called, and asked to inject into every tumor or enlargement a few drops of carbolic acid solution, such as he would use in malignant carbuncle. Or he might open all the enlargements, by two free cuts crossing each other, and after pressing out as much of their contents as possible, fill the cavities with a powder composed of equal parts of quicklime, carbonate of sodium and alum. This ought to destroy the fungoid growth.

It must now be plainly evident that the writer considers follicular mange a malignant disease after it has once fairly started, and one that demands the most energetic treatment.

If under either form of treatment advised the eruption is disappearing, the same evidently successful method should be persisted in, not forgetting the bathing, from tip to tip, with benzin, which is to help prevent the disease from spreading, and which, as previously recommended, should occur twice each week. And even did a cure take place, the entire treatment should be applied for a month thereafter, against a recurrence.

If in any case a gain is not effected by treatment within two or three weeks, the case can rightly be considered hopeless, and of course the victim should be then destroyed.

ERYTHEMA.

Erythema is an inflammation of the skin which has various forms, but the most common, and only one that can be considered here without inviting confusion, is that of red patches of variable shape and size. These fade on pressure, there is little or no swelling, pain, or disturbance of the general system, and only slight itching.

The eruption is really no more than a simple congestion, and the redness of the skin is identical with that produced by a mustard-plaster or other like irritant.

It usually forms suddenly, and may as quickly disappear without leaving any trace; or the skin may burst, a watery discharge follow, and crusts form.

All parts of the body are liable to be attacked, but the head and extremities are commonly affected.

The causes of this affection are many, and include gastric and intestinal disturbances, uncleanliness, want of proper grooming, long and matted hair, extremes of heat and cold, poor food, etc.

Medication is scarcely necessary; for if existing derangements or disorders are overcome and errors in management corrected, the trouble will generally at once disappear. For example, among the most common sufferers are long haired, overfed and indolent house-pets, the eruption appearing as soon as the weather is very warm. Here the cause is evident, and if removed by clipping the hair, the erythema as a rule promptly fades.

CHAPTER III.

PRURIGO.

Now and then, but fortunately not often, are encountered cases of severe and persistent itching which evidently are not parasitic, nor does there seem to be sufficient eczema or other actual disease of the skin to account for the disturbance. There is an eruption in such, but only of very mild form; indeed, it is not likely to appear except to the eye of the careful examiner, although appreciable to the touch, the affected surface feeling somewhat rough and uneven as the finger passes over it.

In this affection, termed prurigo, the eruption consists of very minute papules or pimples, usually not larger than common pin-heads. Sometimes they are slightly reddish, but generally the difference in color between them and the surrounding skin is not noticeable. They have a decided preference for the thin and delicate skin of the abdomen, and on the inside of the thighs and elbows; and cause intense itching, which excites scratching, and that in turn produces an artificial eczema.

The latter usually soon becomes so prominent that it conceals the evidences of the prurigo, otherwise the scratched skin would appear dry and thickened, with here and there a few small blood-red crusts.

The causes of prurigo are not well understood, but there are certain general conditions with which it is known to occur so frequently that it is believed that they have a decided causative influence. For example, the affection is much oftener noted in dogs that are but indifferently cared for than in the fortunate, well-fed tenants of clean, dry kennels. Again, instead of appearing in the strong and healthy, it is more liable to develop in feeble and poorly nourished dogs, and especially those in which the tone of the blood has been lowered by long and severe attacks of sickness.

It is not peculiar to any age, and the young and old alike suffer from it; but the latter more severely, because with them it proves by far the most obstinate.

In the treatment of prurigo, naphthol is one of the most serviceable agents. It should be mixed with vaselin, — one drachm of the former to two ounces of the latter, — and be well rubbed into the affected skin every night; after which the parts should be dusted with dry sulphur.

Twice each week, if possible, the patient should be well washed, sulphur soap being used.

The naphthol preparation ought to greatly lessen if not entirely control the itching, but if it fails to do so, the following should be tried :

Iodol and chloral hydrate, of each one-half a drachm ; glycerin, two drachms ; lard, one ounce and one-half.

Apply morning and night, with gentle rubbing.

When the victims are very young puppies a simpler treatment would be better, and the mild ointment of sulphur and lard is recommended.

It is not necessary to apply internal treatment for this disease, but of course the general health ought to be improved in every possible way, and all faults in management, etc., corrected.

PRURITUS.

Pruritus or "itching" is usually a symptom, not a disease, but occasionally are seen cases in which there is intense itching, evidently due wholly to some internal cause which cannot be defined, and to such the term pruritus is conveniently applied. The itching that is associated with eczema, prurigo, mange and like parasitical affections, and other diseases in which it occurs as a symptom, does not come under this head ; for pruritus is a purely nervous manifestation, and not attended by any alteration of the skin or tissues. The affection thus limited is chronic, and may be confined to a particular region, or extend over the entire surface.

The etiology of pruritus is frequently obscure. It is known, however, that certain drugs taken internally will excite it. In diseases of the kidneys, jaundice and other liver disorders, it is quite common. It may occur in plethora due to over-feeding and want of exercise, also with worms, constipation and indigestion, and in consequence of poor circulation of the skin induced by lack of cleanliness and proper grooming. Old dogs are quite frequent victims, and in them the trouble is attributable to the structural changes in the skin which age produces.

In young dogs the affection is most common among those which are much inbred and of highly nervous temperament.

Let the fact be kept in mind that if there exists any structural alteration of the skin, except what might be induced by scratching alone, the case is not one of pruritus.

The victims must be studied with exceeding care before treatment can be properly applied. Then all existing disorders should be overcome, and the general health improved as much as possible by ample exercise, judicious feeding, kennelling, etc.

A highly efficacious ointment may be made of the yellow oxide of mercury, one part ; vaselin, two hundred parts. This can be applied to all itching spots

that cannot be reached by the patient's mouth ; and applications morning and night are advisable. Before commencing its use it would be well to wash thoroughly with soap and water.

The solution of menthol recommended in eczema may be employed to combat the itching if it is very intense ; but frequent bathing, carbolic soap being used, will have a highly salutary effect upon that troublesome symptom.

PITYRIASIS VERSICOLOR.

Pityriasis Versicolor is an affection of the skin resulting from the growth of a microscopic plant or vegetable parasite.

It is doubtless contagious, but far less so than parasitic diseases generally, and, beyond doubt, prolonged contact is necessary for its transmission.

It appears on the skin as pale yellow, grayish, or yellowish-brown spots or patches, which are usually smooth and shining, also dry and covered with many small white scales ; while often a few small red pimples are to be found on some of the patches ; and frequently there is considerable accompanying irritation.

These spots are at first very small and scarcely noticeable even when on short-haired dogs, but gradually they grow, often reaching the size of a trade-dollar, and not impossibly exceeding it. Two or more of them also sometimes unite, and thus much larger areas of skin are affected.

After attaching itself to the surface the parasite penetrates ; and the hairs become brittle and ultimately fall out, leaving the spots quite bald, with only occasional exceptions, in which a few straggling hairs remain.

In shape the affected spots on the body are quite uniformly circular, and as they grow in size there is a tendency on the part of the eruption to clean up in the centre ; thus it now and then assumes a resemblance to ringworm. On the legs, however, the spots do not retain so notably the circular form.

Itching accompanies the affection, but at worst it is only moderate, and in most cases the discomfort is scarcely noticeable.

While the direct cause is a vegetable parasite, there are certain general conditions which so favor this and like affections that they deserve emphasis. For instance, moisture is necessary to parasitic growth ; it is not surprising therefore that dogs occupying damp kennels are frequent victims. Again, parasitic affections thrive where filth abounds ; consequently lack of cleanliness must be considered a contributing cause. Not impossibly, also, if the general health is not good, the liability to this disease is somewhat increased ; which assumption is suggested by the fact that it most often appears during the teething period, when the system is never at its best.

Some authorities have found more cases of the disease under consideration among short-haired than long-haired dogs. While in the latter its development would be the easiest, among the former transmission by contact should occur the most readily, a thick coat being decidedly obstructive.

No breed or age is exempt from this disease, but much the largest proportion of its victims are puppies; and although it is sometimes found as early as the second month, only rarely does it appear before the fourth month, while very generally, as previously intimated, it attacks between the fourth and sixth month.

A certain means of destroying the parasite of pityriasis versicolor is the tincture of iodine. With this every spot should be carefully painted; so, too, the unaffected skin for at least half an inch beyond its margin; and on each application, that the remedy may act in full strength, a second layer of the paint should be put on after the first has dried. It should be used daily for about one week; then the entire coat of the patient be washed with benzin.

The iodine having been withheld for a week thereafter, if the edges of the spots or patches then appear paler and thinner, it may be assumed that a cure is taking place, and all that is required is to keep the surface softened with some fatty preparation, as the simple ointment of sulphur and lard, cocoanut-oil, cocoa-butter, vaselin, or the like. But if the conditions seem less favorable, the iodine treatment should be applied for another week.

It is scarcely possible for the parasite to resist the tincture of iodine, but in event that remedy did not seem to act well, balsam Peru or tar might be tried; and in very rebellious cases Canada balsam and carbolic acid, in equal parts, should be applied, as advised in eczema.

With some authorities the most popular remedy is a lotion made of sulphur and lime; one-half a pound of the former and one-quarter of a pound of slaked lime being right for two quarts of water. All this is boiled in an earthenware vessel until it has been reduced one-half, then set aside to cool and settle; after which the clear fluid portion is poured off into a bottle, that is to be kept well corked. It is applied daily with a stiff brush, not only to the patches of eruption, but to unaffected surfaces within, certainly, half an inch of them, that none of the disease may escape untouched. The treatment, after the disease has been killed should be the same as that advised to follow the use of the tincture of iodine.

Medicines given internally cannot have any effect upon the disease, but of course if the general health is not good, every effort should be made to improve it.

Although the danger of the disease being communicated by the dog to his master is very slight, the possibility of transmission should be kept in mind.

A simple form of pityriasis which is often encountered in dogs is analogous to the affection, quite common in man, termed dandruff. In this, myriads of small white scales form, and generally they are most abundant about the head.

It may be due entirely to local causes which irritate the skin, as too frequent washing, especially with soaps that are strongly alkaline, using one of the popular lime and sulphur dips for fleas or mange, a comb that has sharp teeth, or the application of irritants in ointments, lotions, liniments, etc. In the largest proportion of cases, however, the causes are manifestly internal, and the subjects are victims of disease or derangements. Acute attacks in which there is very high fever, and the same runs for several days, often leave for a time the skin very dry, and it is soon covered with small, fine scales. Indigestion that has persisted for several weeks is illustrative of the causative effect of derangements, for in such cases this skin trouble is quite prone to appear. It is also often attributable to faulty management, as a denial of sufficient pure, fresh water, the giving of poor food, or food not wisely chosen, or too scanty a diet.

It may, indeed, be accepted that in all cases of this form of pityriasis in which the cause is not external or in the skin itself, some impairment of the health exists which must be overcome before a cure can be rightly expected.

In very many cases it will be necessary to employ local treatment. A very crude but often effectual application is composed of whale-oil and sulphur, two drachms of the latter to every ounce of the former.

A less offensive preparation, and one that acts even better than the foregoing, is the following :

Salicylic acid, one drachm ; borax, one-half an ounce ; balsam Peru, one-half an ounce ; vaselin, four ounces. Apply freely once daily, rubbing it well into the skin.

When this or the oil and sulphur mixture is being employed, after the third or fourth day the patient should be thoroughly washed, some non-irritating soap, like Castile or glycerin, being used in the operation. A return can then be made to the same preparation if necessary, or there may be applied instead a five per cent alcoholic solution of chloral hydrate, with which the scaling parts should be drenched daily. This is a very sure remedy against the formation of small scales, and may even be used from the first, which is advisable where the patients are house-pets ; but a previous application of one of the oily preparations for a short time would be wise, since, in consequence of the itching and scratching, there is commonly some eczema associated, and it must be overcome.

FAVUS.

Favus is a parasitic disease, characterized by the formation of sulphur-colored, cup-shaped crusts. At the beginning the eruptive spots present simply circles of scales ; and herein they have some resemblance to ringworm.

Soon, however, bright yellow specks appear, which rapidly increase in size until the peculiar cup-like crusts are developed.

These, the centre of each of which is generally pierced by a hair, vary in size from that of a pea to a shilling; and many of them coalesce or run together, and thus large, thick, irregular crusts are formed.

Single crusts can be easily detached without breaking; and when removed, in every instance a cup-shaped depression is left.

The crusts emit a peculiar musty odor. If allowed to remain, by continued pressure they so affect the hair at its roots that it falls out. Nor does it ever grow again with former luxuriance, while the hairs restored are coarse, wiry and unmanageable.

Itching is not a symptom of favus; instead, the eruption is attended with pain; but it is not severe.

The disease is contagious and may be not only transmitted from one dog to another, but from dogs to mankind; and it is interesting to note that besides dogs it has been observed in mice, rabbits, cats and hens.

While the real cause of favus is a parasite and fungus growth, and the same can be conveyed from one subject to another, as with all like diseases, certain general conditions favor it. For instance, it flourishes best upon the skins of dogs that are poorly fed and otherwise badly managed, and consequently are not in high health. In other words, although contagious this affection is much less so than many other affections of the same class; and dogs that are frequently groomed and well kept would not likely become diseased, even were the spores which produce it conveyed to them, because clean and healthy skins are not soil that is favorable to the development and growth of the germs.

Favus is curable, but not without patience and careful treatment. The spores of the fungus penetrate to the deepest parts of the hair-follicles, and to reach them with applications is always exceedingly difficult, and scarcely possible before the hairs in the affected spots have been pulled out.

The first essential step is to soak the crusts with lard or an oil, and when they have been detached, all the hairs in the affected spots should be drawn out. If the disease is not extensive, the following may then be applied three times daily:

Sulphuret of potassium, one drachm; green soap, four drachms; lard, one and one-half ounce.

Where the disease is extensive the proportion of the potassa in this preparation should be reduced to one-half or one-fourth, as appears necessary; or in such cases an excellent application would be the following:

Chrysarobin, twenty-five grains; chloroform, one drachm; flexible colloidion, seven drachms.

This should be very quickly applied with a camel's-hair brush, and one

coating daily would likely be sufficient. Its use should be persisted in for at least three weeks, or until the skin is assuming a healthy appearance.

Another valuable application is Canada balsam and carbolic acid, in equal parts, to be used as in eczema.

RINGWORM.

Ringworm is a disease of the skin resulting from the growth of a vegetable parasite or fungus. It manifests itself by small round scaly patches, in which the hairs soon become dry and brittle, and finally break off near the surface. These patches are covered with thin white powdery scales. At first about as large as an American penny, they spread quite uniformly, usually reaching the size of a trade dollar; and they may be even larger. Their borders are ridge-like, being slightly raised; and as they extend, their centres clear up more or less, the thickening disappearing, and the skin therein regaining somewhat its natural appearance: thus they retain the annular or ring-like shape which their name implies.

This is the most common form of the disease, but it sometimes appears as small pointed vesicles, containing a clear fluid, and arranged in circles; and it may even take the form of pale red spots, with a small whitish scale in the centre.

Treatment should be undertaken with the fact in mind that the cure must be complete, for if a trace of the disease remains it will soon be redeveloped.

A very potent remedy is the tincture of iodine, with which the affected spots, also the healthy skin within half an inch of them, should be painted twice daily for a week. This will cause the epidermis to peel off, and with it the disease be removed.

A remedy even more powerful than the tincture of iodine alone can be made by uniting that tincture with equal parts of carbolic acid crystals and the hydrate of chloral. This combination possesses very strong anti-parasitic properties, penetrates deeply, and hastens the absorption of inflammatory products. It should be applied, by means of a camel's-hair brush, to the eruptive patches and about one-half an inch of the adjacent healthy skin. One application daily for three days should be the rule; and thereafter it ought to be put on every third day until the ringworm has evidently been totally destroyed; or if there remains much thickening of the tissues beneath, applications at such intervals may be persisted in until the skin has thinned down to near the normal. All that remains to be done after using it is to keep the skin softened for a time with cocoa-butter, vaselin, or the like.

Soap will cure in many instances if the skin be well scrubbed with it; and

that simple agent is rendered more active when combined with sulphur, as follows:

Green soap and sublimed sulphur, of each two ounces; glycerin, one ounce.

This ointment or paste should be vigorously rubbed onto the diseased patches or spots twice daily for a week, and then washed off, all other parts being well scrubbed at the same time.

An efficient and non-poisonous application, to which there can be no objection for use even on house-pets, is a solution of the hyposulphite of sodium in water, in the proportion of one drachm of the former to one ounce of the latter. If the eruption be kept moist with it, a cure ought to be speedy.

The least objectionable remedy, and one which often proves quite as efficacious as any other, is pyrogallic acid in collodion, in proportion of thirty grains of the former to two drachms of the latter. This constitutes a paint which "sets" within a minute, therefore it must be put on quickly. A camel's-hair brush being employed, the rule should be two or three applications daily until the eruption has disappeared. One coating having been applied, if the same be too thin or spots remain untouched, a second should not be put on within ten minutes; at the end of which time the first ought to have become dry and hard. Soon the "paint" will have been detached in places, and before another application is made it will be necessary to remove the loosened portions.

Were it not possible for the affected dog to reach the eruption with his mouth, and simple preparations had failed, the following might be tried:

Chrysophanic acid, one drachm; white precipitate, twenty grains; lanolin, one drachm; and benzoated lard, six drachms. This should be well rubbed into the ringworm, three times daily, after it has been, in so far as possible, freed from scales by washing.

This ointment alone is but rarely disappointing. It may, however, prove so; in which event its use must be prefaced by the following treatment: First wash with soap and water, a little of the carbonate of soda having been put into the latter. After thoroughly drying the eruptive spots, lightly apply acetic acid to them by means of a small camel's-hair brush. Allowing about five minutes for this to soak in, the chrysophanic acid ointment can then be used with certainty of good effect. Every day thereafter this same preparatory treatment ought to be employed before the ointment goes on.

If the ringworm has existed a long time and the skin is much thickened, the use of the tincture of iodine might be persisted in until the same is thinned down and restored to its normal condition. Or after the iodine has been applied for a week and the parasite destroyed, the oil of tar and glycerin—one part of the former to three of the latter—could be used for the purpose of reducing the thickening.

PSORIASIS.

Psoriasis is a chronic disease, which usually begins as small red pimples scarcely larger than pin-heads, each being surmounted by a thin scale. These may be abundant and well scattered, and show but little if any tendency to increase in size ; but as a rule they spread, and some of the patches coalesce or unite, and thus the eruption has the appearance of mortar spattered over the skin.

In some cases the patches are few but of considerable size, and by uniting they cover large areas.

As each patch spreads, its centre cleans up, and the skin at that point becomes normal ; consequently after a time the eruption is really a series of ridges of red and thickened skin, covered with dry white glistening scales that have been termed mother-of-pearl-like ; and these ridges, although irregular, all approach ring-like forms.

This disease itches as it makes its appearance, but that disturbance is only slight.

As to causation, practically nothing is known ; the affection exhibiting little or no partiality in choosing its victims.

The most convenient application for this affection consists largely of collodion, because remedies incorporated with that are fastened, as it were, to the eruption. It is composed as follows :

Chrysarobin, twenty-five grains ; salicylic acid, twenty-five grains ; chloroform, one drachm ; flexible collodion, seven drachms.

This should be quickly applied, with a small, stiff paint-brush, once daily ; and its use be persisted in until the skin is nearly restored to normal condition.

It can safely be assumed that whenever the vitality is impaired the occurrence of this affection is favored, therefore if the general health of the patient is not good, appropriate treatment ought to be administered to restore it.

SECTION XII.

INTERNAL PARASITES.

CHAPTER I.

INTRODUCTORY.

AN exhaustive treatise on the subject of internal parasites or worms might interest some, but not the average reader, to whom solid facts only are important and of special value, such being quite sufficient to enable him to discriminate between the various common forms of these troublesome invaders, effect their expulsion, and recognize and properly treat the disorders to which they give rise.

There are many different species of worms; and although the largest proportion of them abide in the intestines, some go deeper and lodge in the liver, others in the eyes; while the nasal cavities, lungs, bladder, kidneys, heart, brain, and even the blood, spinal chord, muscular tissues, and serous membranes have their special inflictions in the way of parasites, which exhibit a decided preference for them. For instance, the giant strongle seeks the kidneys, the wrinkled thread-worm the bladder, and the cruel thread-worm the heart. Indeed, every important organ or structure of the body may be invaded by these often fatal pests. But, fortunately, dogs are not frequent victims of parasites which penetrate very deeply; moreover, when one has done so the fact is scarcely determinable; nor could aught be accomplished by treatment; therefore for practical purposes it can only be necessary to consider herein those which are often encountered and have their habitat in the stomach or intestines.

OXYURIS VERMICULARIS.

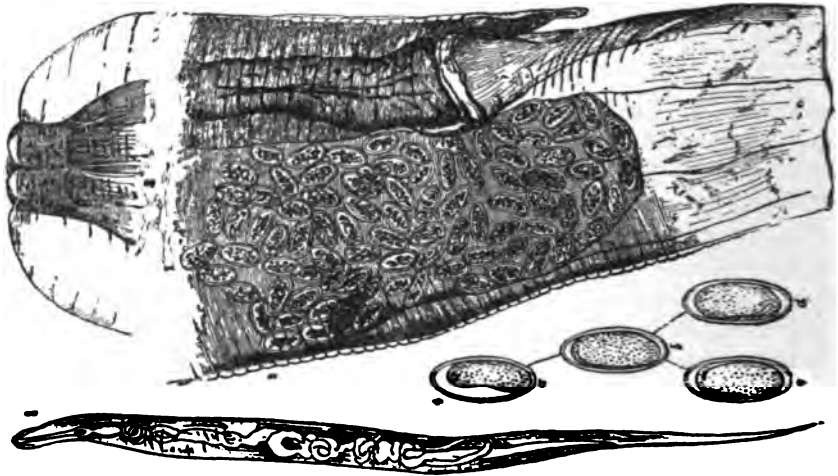
Thread-worms are silvery white in color, of small size, the largest being but little over one-half an inch in length, and have the appearance of small white threads; hence their name.

They are located in the lower part of the intestinal canal, — the so-called

large intestine, — where the excreta accumulates before being expelled, and from which waste matter they derive their nourishment.

The ova or eggs from which they are hatched are produced in immense numbers. These may be taken into the stomach with the food and drinking-water, while the coat is being licked and itching parts bitten, and likely in various other ways. The gastric juice dissolves the envelope or shell covering. Thus set free, the young quickly pass downward into the intestine, where they develop so rapidly that they are quite mature before they have reached their abiding-place, also endowed with a vitality that is remarkable.

Itching is the symptom excited by these worms that is likely to first attract attention. It is not, however, equally severe at all times. If a dog is often



1. A Female *Oxyuris Vermicularis*, displaying the normal position of the digestive and reproductive organs, and the points at which their several outlets terminate. Magnified about 12 diam. 2. Oral extremity of the same, showing the partly protruded lips, the lateral alæ, pharyngeal muscles. Magnified about 300 diam. 3. Section from the lower part of the body, exhibiting the mode of termination of the intestinal canal, and numerous ova lodged within, in the folded extremity of one of the uterine horns. Magnified about 150 diam. 4. Four ova: *a*, showing the commencement of the embryonic formation, and *b*, *c*, *d*, the completed tadpole-shaped embryo in their interior. Magnified about 300 diam. (Cobbold.)

seen dragging his hindquarters over the floor or ground, and biting the parts adjacent to the outlet of the bowel, there is reason for suspecting thread-worms; and if the subject be infested by them, they can be found in the intestinal discharges, often in great numbers, and sometimes agglutinated with mucus into feculent balls.

They are generally well down in the large intestine, in the lowest part of it — the rectum, — and only a short distance from the anus. From this they sometimes crawl out; and may cause bitches special annoyance by entering

the vagina, where they excite itching, and possibly give rise to a thin, milky discharge.

Aside from the local symptoms produced by these worms, and consequent uneasiness and nervousness, mature subjects are not likely to be affected; but when the victims are young puppies, often the appetite becomes capricious, and there is more or less palor of the mucous membranes, which indicates that the blood is poor.

Treatment is generally fairly easy, since the most of these pests are within reach of destructive injections.

Such may be variously composed. Common salt and water, one teaspoonful to a pint, acts well. So also the infusion of quassia, made by adding one ounce of the chips to a pint of boiling water, and allowing it to stand in a warm place for about two hours.

If half a teacupful of this be injected once or twice daily it will soon effect a cure.

Another efficient remedy can be prepared by shaking up one-half a teaspoonful of the oil of turpentine with four ounces of olive or sweet oil. This should constitute one injection if the patient be a very old pup or matured dog.

The injections ought to be repeated once or twice daily for nearly ten days.

Occasionally they will be found to effect only temporary relief. The reason for this appears in the fact that the oxyuris develops high up in the intestine, and only the full grown, descend and reach the rectum. If injections fail, the patient should be treated as though he had round-worms.

ASCARIS MARGINATA.

The *ascaris marginata* is the principal round-worm found in dogs. No other species of worm occasions them so much trouble and disease, not excepting the tape-worm; and it is safe to assert that more than 50 per cent of dogs are victims of this parasite.

It resembles the common earth-worm, and is of a yellowish- or reddish-brown color. When full grown the average male is from two to three inches, and the female from five to six inches in length; but often these measurements are exceeded by several inches.

Its body is round and tapers toward both extremities; and its thickness generally is about that of an ordinary goose-quill. It is very active and strong, and has a thick, dense envelope, which resists pressure and the knife much like rubber.

Round-worms are usually expelled singly or in small numbers, with bodies curled, but occasionally there are many of them in one discharge; when most

likely they are intertwined in the form of a ball. They inhabit the upper portion of the small intestine. Often, however, they migrate into the stomach; up from which they are liable to be thrown during attacks of vomiting that they induce. They sometimes ascend to the throat and cause gagging or violent coughing, which lead to their expulsion; doubtless also when on such excursions they have now and then succeeded in getting into the upper part of the wind-pipe, and so produced spasm of that tube and fatal suffocation, generally during attacks of convulsions, for which they were likewise responsible. Nor is it impossible for them to reach the lungs, being sucked down the bronchial tubes, and death result immediately, or be delayed until a pulmonary inflammation has been set up.

Occasionally these worms make their way into the nasal passages, where they excite irritation that is attended by profuse discharge and quite constant and distressing sneezing. Again, in rare instances they have entered the gall-bladder, also the biliary ducts, and thus obstructed the flow of bile, and sometimes given rise to abscess of the liver. Indeed, they have been known to invade the pancreatic duct. But generally their course is downward into the large intestine, from which some are discharged with the waste matter, while occasionally one wriggles out.

Worms infest dogs of all ages, but puppies are the most frequent victims, and with them the mischief caused is far greater and more often fatal than with matured subjects. It is a strange fact also that now and then large numbers of these pests have been found in puppies less than two weeks old; and, indeed, some of their victims have only just entered the world, if reports can be credited.

The round-worms in very young victims are generally scarcely more than an inch long, and of about the diameter of coarse linen thread, short pieces of which they closely resemble. Of the exceptions to this, one of the most notable is reported by a widely known breeder of repute, who states that from the dead body of a puppy only two days old he took four round-worms, all of which were nearly three inches long.

From experience it would seem that the chances of being infested by worms increase somewhat as the health and vigor decline, when naturally the ability to expel embryos taken into the body lessens in corresponding degree. But it is easy to believe that they are best when digestion is sluggish and imperfect, too much is eaten habitually, or the food is either not well adapted or positively unwholesome; for then the stomach and intestines are seldom free from food refuse, for which worms exhibit a decided preference. As to the special conditions, however, required for the development of round-worms, little or nothing is positively known. Nor is it known how puppies acquire them; yet it is highly probable that they oftentimes swallow the eggs and larvæ directly, also take the same up with their food and drink. And certainly very generally the

most favorable opportunities for infection are afforded, as will appear from the following :

The eggs are laid in the intestines of their hosts, and expelled with the waste matters in great numbers and sometimes in great masses, and once in the world they retain their vitality for a long time. After being expelled it is necessary for these eggs to mature, and they do so speedily in fecal matter, water, or damp places ; and this essential stage of development having been completed, all is in readiness for the final stage. Now let the eggs be taken up and enter a stomach, and the young worms will burst the shells, softened by the gastric juice, and speedily mature.

Such in brief is the course of infection with this worm ; and considering the ease with which it occurs, it is not at all surprising that puppies rarely escape it.

A mother harboring the pests is constantly throwing out of her body large quantities of eggs, and these are deposited about in her kennel and yard, in which, even if the fecal matter is removed daily, some are sure to be left, and find here and there, upon the floor, sleeping-bench, and ground, the moisture which is necessary to their development. Assuming now that she has been treated for worms, and all she had have been expelled, still she is a menace, for she must take up immense numbers of these eggs in her coat, and carry them with her wherever she goes. Consequently, if removed from her usual quarters she must soon become infested, through some of those scattered by her over the floor, on her bedding, etc.

Clearly there is now absolutely nothing to prevent her puppies from ingesting these eggs, even during the first days of life, and swallowing them direct from her breast, hair, bedding, or the floor ; and even did infection not occur in this way, it must soon occur through the food or drinking-water, from which it would be simply impossible to keep the eggs, lying about as they are in such abundance.

In this connection it is well to plainly point to the fact that if a mother is free from worms at the time of whelping, her puppies will be far less liable to suffer from such pests during the earliest months of life ; hence a mildly acting vermifuge should be administered between the sixth and seventh weeks after mating. And thereafter, twice daily, until her puppies are born, she should take of the sulphate of iron one grain if of medium size breed ; two grains if of the largest breed ; one-half a grain if of the size of fox-terriers ; and one-fourth of a grain if a toy terrier.

This tonic, which is very unfriendly to worms, should be administered in powdered form, and thrown to the patient, concealed in thin slices of beef.

When the foregoing treatment has been applied the chances of trouble in consequence of worms cannot be great ; but, nevertheless, decided symptoms of them may be manifested. If so, to give either of the most popular worm-

destroyers later than the seventh week of pregnancy must be somewhat hazardous, and especially since it would be necessary to follow it with a cathartic, the action of which cannot always be controlled. That is, "opening medicines" that generally act mildly are liable to purge severely and cause violent straining when there is no reason to expect such unusual effect.

If, therefore, marked symptoms of worms appear late in the pregnant period, the use of the sulphate of iron should be discontinued, and the following mixture be obtained :

Tincture of iodine, one-half a drachm ; water, two drachms.

Of this the dose is three drops for a bitch of medium size, — five drops if one of the largest breeds — and it should be administered in a little milk every three hours, between the feedings, until worms are expelled.

For a fox-terrier, or the like, the dose would be two drops ; and one drop for a toy.

It is not likely to disorder the bowels, but should diarrhœa occur this medicine ought to be stopped at once.

The fact deserves special emphasis that, very strangely perhaps, in the hands of some who have the care of dogs certain worm-destroyers seem quite impotent, and yet many others have found them to act eminently satisfactorily. Appreciating this, and earnestly desirous that, as securely as possible, his readers shall be fortified with the essential remedies for all affections that are known to admit of cures, the author not only advises the course which he deems safest and wisest, but in some instances adds the favorite methods of reliable breeders of long experience, even although he cannot approve of them for general practice. And consonant with this, he outlines the treatment of one of America's best-known breeders of setters, which is as follows :

About a month before his bitches are to be in season he administers, every other day for a week, two-thirds of a teaspoonful of turpentine in a tablespoonful of castor-oil, always after a fast of twelve hours. Milk is then allowed them in such quantities as they will drink. During the first eight weeks of pregnancy he gives the same dose once each week, and claims that as a result of this treatment his pups are quite well advanced in life before they exhibit any signs of worms.

Let it be remembered that when a vermifuge is given to an expectant dam, while the same is acting she must not be in the quarters in which she is to whelp. Furthermore, two or three days before the eventful period is expected, she should be temporarily removed, and the whelping-quarters be thoroughly cleaned, and washed with boiling water containing carbolic acid, for the purpose of disinfecting them and destroying all eggs of worms that may be present. She, also, should be disinfected, and all such eggs about her destroyed, before she is returned to the whelping-quarters, precipitated sulphur being used, and the same rubbed freely into her coat and over her breasts and teats. In fact to

every part, from the tip of her nose to the end of her tail, it should be applied with generous hand. And this operation ought to be repeated about twice each week while the puppies remain with her, care being taken to dust all the sulphur off her breasts and teats before they again nurse—that is, until they are at least two or three weeks old.

One requirement which writers on canine affections seem to have ignored, notwithstanding it is clearly important, is that of obtaining the drinking-water always from the purest sources. Water from small streams, shallow wells, and the like, is liable to contain the ova of round-worms, hence ought not to be used. Indeed, did the family use filtered water, it would be none too good for the kennels, and especially with bitches in whelp.

Worms give rise to somewhat different symptoms in nursing puppies than in older pups. In the former they almost invariably set up an inflammation of the lining of the intestine, called enteritis; and with this there is diarrhœa.

The bowels may move with normal frequency at first, but as a rule it is not long before the discharges occur at very short intervals, and are thin, scanty, and largely made up of mucus, which is generally reddish in color, and voided with difficulty and pain, as evinced by straining and groaning.

The diarrhœa often presents peculiarities which indicate, with some degree of certainty, whether or not the number of worms present is large or small. For example, if large the inflammation is generally quite extensive and the diarrhœa persists—that is, it continues day after day; but if the number is comparatively small, the diarrhœa is usually less constant, and may be present for a day and then disappear, not to return for several days, and perhaps not for a week or more. Usually, also, in such cases the mucus, while possibly quite abundant, is colorless or only slightly pinkish, and rarely is it of deep red color, as in the first instance.

This is the rule, but exceptions are not infrequent, in which a small number of worms cause symptoms of sufficient severity to justify the impression that a large number are present.

A puppy two or three weeks old suffering from worms is somewhat bloated, and either altogether refuses the breast, or takes it only now and then. It whines or moans more or less constantly. Discharges from the bowels are frequent and watery, or what is termed slimy, from an excess of mucus, also sour smelling. Doubtless because of its odor, the mother does not clean the poor little one, hence, soaked in filth, it speedily becomes exceedingly offensive; and unless relief is promptly afforded, it emaciates rapidly, chills, and dies.

The appetite of puppies three or four months of age, or over, is usually capricious; it being now nearly or entirely absent, and again quite ravenous. After eating only a very moderate quantity their abdomens are much distended; or, in other words, they bloat up greatly and with astonishing rapidity. They

vomit occasionally; their breath is foul; they lose flesh; are noticeably weak; their skin appears to have darkened; and their hair becomes dry and harsh, and sometimes falls out in patches. Their bowels are no longer regular; and while they may suffer from short attacks of diarrhœa, from which they seem to wholly recover, as a rule once diarrhœa sets in it persists until the worms have been expelled. It is also evidently attended with pain, which at times is very severe.

Constipation of innocent form sometimes exists for short periods, but in most cases of that trouble it is very painful, also dangerous, for it is due to an accumulation of worms in a mass or ball too large to be expelled except with much delay and suffering.

Complete paralysis of the hind legs is very common among puppies between four and eight months of age; and although recovery occasionally occurs where the worms are promptly ejected, it is, unfortunately, the exception, not the rule.

Other symptoms referable to the nervous system are often present, as "dumpishness," fleeting pains,—indicated by sharp, shrill cries at intervals,—twitchings of the muscles; and even chorea has been known to be a consequence of worms; while convulsions are frequent, and such attacks are often fatal.

Aside from the dangers that arise from that disposition to wander from their usual abiding-place, to which reference has been made, worms may bore through the intestinal walls if the same be inflamed or ulcerated, and cause peritonitis and death. Again, they may indirectly induce what is known as intussusception, which is the tucking or slipping of one portion of the intestine, stove-pipe like, into another, thus causing complete obstruction of the bowels, which is almost always fatal.

In young females a thick, white discharge from the vagina is sometimes noted, and usually persists until the worms that escaped from the intestine and crawled in there have been syringed out.

If worms are harbored and they fail to induce such grave symptoms as convulsions, paralysis, or the like, their effects may yet be very disastrous, the vitality of the host becoming so impaired and his system so enfeebled that healthy growth and development are impossible.

Yet a little more remains to be said of the phenomena produced by worms. The opinion of that ancient writer Avicenna was that, "From the body of worms comes a noxious vapor which rises to the brain; the constituents of these beings, absorbed with the chyle, pass into the blood and deprave the humors."

This is opposed to the general belief that the harmful effects of worms are produced only mechanically. It would seem that in the quaint expression quoted there was a germ of truth, and that the juices or fluids extracted from

round and other worms are, at least at times, positively poisonous. Nor is this theory lacking support. Those who handle worms in the laboratory frequently suffer from various eruptions, also inflammations of the eyes, ears, nasal passages, throat, etc. And it is assumed that these disturbances are sometimes caused by an irritating vapor emitted from the bodies of the parasites when cut into pieces, and sometimes by direct contact of the worm-juices with the parts afterward affected. There is a case of a child on record in which the sight became seriously impaired, and yet complete recovery at once followed the expulsion of several worms by means of *santonin*.

Fluids expressed from round-worms inhabiting the horse and pig, when injected subcutaneously into guinea-pigs, have caused convulsive movements or real convulsions and death; and death by suffocation, accompanied by convulsions, is known to have occurred in a surgeon within twenty minutes after he had punctured an hydatid cyst.

It is easy, therefore, to believe that, instead of being merely nervous and reflex, the symptoms occasioned by worms are often really due to the absorption of fluids from them, the same perhaps being harmless at times, but becoming poisonous under certain conditions, and then capable even of causing death.

Returning to the symptoms generally occasioned by round-worms, seldom are any noted in mature dogs which point very plainly to them. In some instances there is constipation, but diarrhœa is the rule; and the same may obstinately persist until the worms are expelled, but oftener attacks of it come and go, each lasting not over two or three days. The discharges are slimy, as in puppies, and have a rather peculiar odor, which has been termed wormy; and although generally blood-stained, they may be of grayish color.

The appetite is often variable, being at times wholly lost, then indifferent, and again insatiable. But notwithstanding food in abundance is consumed, the blood is poor, as indicated by pale gums and lips; there is loss of flesh; the coat, rough and staring, often emits a greasy, sour odor, especially if the victim is a bitch in whelp; and occasionally the hair falls out in patches of considerable size. Eczema is also a frequent complication; and it is quite sure to resist all treatment applied to it direct until the worms have been expelled. If this disease does not set in, the skin usually loses its natural softness and elasticity, and becomes of darker color and covered with fine, dry scales or dandruff.

Mature dogs may suffer from paralysis of the hind legs as a result of worms; such cases, however, are not very common with them, but are confined largely to puppies. Hot nose, some fever at times, offensive odor to the breath, husky cough, disturbed, dreamy sleep, and twitchings during the same, are also quite frequent symptoms; while convulsions occur in a small proportion of cases.

Abdominal distention, or bloating, so constant in puppies, is rather less

common in mature dogs. The effects of worms on the nervous systems of the latter are manifested by restlessness, periods of excitement without apparent cause, alternating with dulness and indifference.

Now will appear the truth of the assertion made in the foregoing, that symptoms positively indicative of round-worms are rare in dogs that have reached full growth. Fortunately, however, it is the rule to assume that they are present in dogs that have fallen out of condition without assignable cause, or are suffering from obscure attacks of illness; and this is to be commended and encouraged, for they are so frequently the victims of worms, experimental treatment cannot often hit wide of the mark; and worm medicine judiciously chosen is never likely to do any harm if given when not required.

Symptoms of the complications which may occur in consequence of worms migrating from the intestines are never sufficiently distinct to admit of positive diagnoses. In many instances, however, the troublesome intruders come to light. As previously stated, when they invade the stomach they are generally expelled by vomiting; by gagging or coughing if in the throat; and by sneezing if in the nasal passages. Whenever jaundice attacks, the possibility of worms being the cause of the obstruction to the bile would naturally suggest itself, and especially if they had been found in the intestinal discharges; but excepting in cases of a whitish vaginal discharge, their presence in other unusual situations would scarcely be suspected.

Although puppies only two or three weeks old, and even younger, sometimes exhibit symptoms of worms, it does not by any means follow that all about that age are likely to be infested. Indeed, as already urged, if an expectant dam be properly treated before whelping, her quarters kept thoroughly clean, and other precautions taken to prevent her puppies from becoming victims, it is fair to assume that the chances are that they will not suffer seriously from worms for perhaps several weeks after they have been weaned.

As for dosing nursing puppies with vermifuges, it should not, as said, often be necessary under right management. But very generally between the fifth and seventh weeks disturbing symptoms appear, and even the fortunate breeder whose little ones have seemed to have escaped worms, usually deems it advisable to administer a vermifuge as early as the eighth week, fearing to delay in the face of the important truth that at that age the great majority of puppies have become infested.

Notwithstanding the liability and danger of early infection are all that breeders believe, such an iron rule is open to objections. For instance, were the dam the sole pet of her kind in a family, or had she no more than one or two mates, and none were quartered in kennels, but all had places by the kitchen fire, and there the whelping occurred, and she and her puppies had been kept until the weaning, then to apply this rule and dose for worms in the absence of any symptoms would scarcely be advisable, for the chances are many

that under such happy, cleanly conditions, the little ones would not be infested, or if they were, the number of worms would be too small to do great harm.

But, on the other hand, had the mother several mates, all were kept in kennels, and the whelping took place in quarters which had been frequented by other dogs, it would be far too much to expect that the puppies had escaped infection; and the rule in question could then be properly applied.

The matter weighed carefully and viewed from all sides, the conclusion justifiable is, that worm medicines should not be given to puppies that have not reached the eighth week unless symptoms of worms are manifested. Also, that instead of dosing all puppies as soon as, or shortly after, they have reached that age, exceptions should be made of those born of house pets and kept in clean quarters; in whom evidences of worms are never likely to be overlooked, since it is necessary to renew the lining of their basket or box several times daily, and mucous discharges or worms must be speedily discovered. But where puppies are born in kennels, and these signs would scarcely be promptly detected, to give a vermifuge soon after the eighth week would probably be advisable; and yet he whose puppies were thriving well and free from all signs of the pests, would often be the gainer by waiting another week or two before applying the "worming treatment."

Anticipating trouble from worms, many breeders, as soon as possible after weaning, endeavor to accustom their puppies to sour milk, which they feed to them two or three times each week. They also frequently put powdered charcoal in their food.

Possibly the milk and charcoal have some destructive effect on worms, — indeed it is quite safe to concede it to the former, — but the value of the latter as a vermifuge has doubtless been greatly over-estimated, and any dependence upon it cannot be encouraged.

Among the drugs employed against round-worms the fluid extract of pink-root and senna and santonin are rightly popular, especially where the patients are very young.

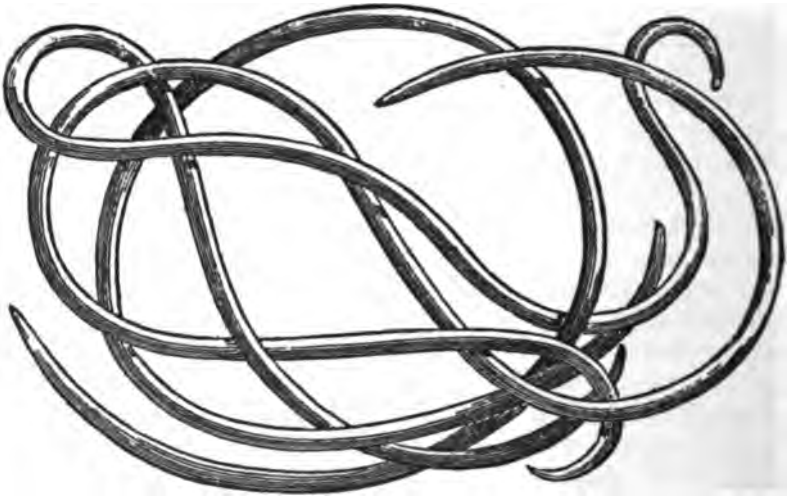
Pinkroot acts as a narcotic on worms, hence the advisability of giving it with a cathartic; and combination with senna is a happy one. This remedy may be administered two or three times daily for as many days; but unless the need seems urgent, it were best to give only one dose daily, and in the early morning, before food has been taken, for then the stomach and intestines are empty, provided, of course, the pups have been weaned; and directly upon the unprotected worms will be exerted the full toxic action of the drug.

If given several times daily probably it will purge before the intended period of dosing has ended; in which event its use should be at once discontinued. If, however, it fails to do so, the last dose of this system of treatment should be followed, in the course of two hours, by a full dose of castor-oil.

For puppies of medium size and largest breeds, between four and six weeks

old, a perfectly safe dose is eight drops ; and the general rule may properly be to administer one such dose every morning for three or four days. One dose daily being the method employed, for fox-terriers and the like the suitable quantity would be about four drops, and for toys, two drops. But were only one dose to be given—not to be repeated on the following day—it might be nearly twice as large.

Increasing the dose with the age, for a puppy of medium or largest size breed, two months old, twelve drops would be right ; eighteen drops for one three months ; and twenty-seven drops after the fourth month. While for smaller breeds the increase should be in the same ratio—that is, about one-half every month over the preceding month.



Ascaris Marginata. (Stonehenge.)

These doses are for puppies that are fairly healthy ; but for the thin and weakly they should be reduced to three-fourths or possibly to one-half.

As previously urged, it is scarcely expedient or safe to dose nursing puppies, but if they suffer from worms and are not speedily relieved the chances are that they will die ; hence one would be justified in applying treatment, and in such cases the fluid extract of pinkroot and senna would promise quite as well as any other vermifuge. The dose for puppies three weeks old and of breeds of medium or largest size is about five drops, to be given early in the morning, and for three or four days if worms are not expelled after the second or third dose. For fox-terriers and puppies of similar size the dose is two drops ; while for toys it should be one drop. Or if urgent symptoms are exhibited and danger to the little ones seems imminent, this vermifuge may be

administered, as to puppies that have been weaned, three times daily for two or three days.

The senna may have sufficient laxative effect, but if not, a dose of olive- or sweet-oil should be given on the third or fourth day when the treatment has been applied only once each day; or within a few hours after the medicine has been stopped if it has been administered three times daily.

It will be advisable always to prevent nursing for at least one hour after giving pinkroot and senna.

Some very intelligent and successful breeders are accustomed to administer pinkroot and senna to all puppies almost as soon as they are born. To the medium size breeds, on the third day after whelping they give three drops of this fluid extract, and repeat the dose every other day until the pups' eyes are opened. Then it is increased to six drops, and that quantity is administered every second day for about a week; after which, still given as often, it is steadily increased, until in the sixth week it is about thirty drops. The use of this medicine is then discontinued, and thereafter these breeders generally give, about once each week, for several months, one grain of *santonin* combined with an equal quantity of *calomel*.

This system of treatment has been described for the purpose of showing that when administered by some, unusually large quantities of vermifuges have been safely borne; but doses so large cannot rightly be recommended for general use. The smaller doses, previously advised, as a rule expel the troublesome intruders; and it goes without saying that, the object being attained, the less medicine given the better.

Another treatment that would seem much too heroic, but which a few breeders, undeniably intelligent, claim to have safely employed, is by the means of the oil of turpentine. Of this they give fifteen drops, in a teaspoonful of sweet-oil, to pups that are only two or three days old. It is evident from their reports, however, that before administering this vermifuge in such doses they are quite convinced that the little ones have worms, and must die unless promptly relieved.

At this point it can wisely be again urged that the effects of medicines are somewhat variable. After acting perfectly well in a large number of cases, in the very next case, which seems precisely like those in which it has been so successfully used, a remedy may prove worthless, and even hurtful. Again, in consequence of individual peculiarities or idiosyncrasies, sometimes one member of a litter will appear to be injured by a drug that other members have not only borne well but been greatly improved by its use. It follows, therefore, that one should not pin his faith on any remedy, even for a single affection; and he ought to be fortified with several, — indeed as many as possible — lest his favorites fail him.

A remedy for worms, which acts well as a rule with puppies, is the sulphate

of iron. This is not only quite a potent vermifuge, but an admirable tonic. To pups of medium size or largest breeds, and about six weeks old, it may be first given in a little milk, in doses of one-half a grain, two or three times daily. With fox-terriers and the like, it were better to commence with about one-fourth of a grain, and with toys, one-sixth.

These doses are very small and can properly be increased if the conditions are right. When taken in too large doses the iron has an irritant effect upon the stomach and intestines; therefore while it is being given the discharges from the bowels should be watched. If there is no diarrhœa, it can rightly be assumed that the dose is not too large, and it will generally be safe to double it in the course of four or five days. If, however, the bowels become loose at any time, the medicine should be at once withheld. These precautions observed, it must prove not only harmless, but beneficial; and under its use, weakly, small, and imperfectly-developed pups, eating but little, will often take on a fresh impulse, and gain with surprising rapidity.

But rarely are large quantities of worms suddenly expelled while it is being used. They are killed and discharged in small numbers, and may be overlooked if due care is not taken.

In event it has caused diarrhœa, when that trouble has ceased, a return can be made to the iron if it has seemed to have otherwise acted well.

By some who have discussed worms and their treatment in print, the carbonate of iron has been highly recommended as a destroyer. It is an admirable tonic, and must improve the general health. It may also give tone to an intestinal tract that is more or less abnormal because of the presence of worms; but it is not a powerful vermifuge. However, there can be no objection to a trial when worms are suspected. At first the doses should be about the same as those of the sulphate of iron; and the remedy be mixed with the food. If no unpleasant symptoms are produced, they may be gradually increased until they are twice, or perhaps three times, the size of the commencing doses.

Some breeders of wide experience prefer santonin to any other vermifuge, and it is certainly efficient, also reasonably safe when properly used. The dose for fox-terriers and the like, five or six weeks old, is half a grain; and for breeds of medium and largest size, three-fourths of a grain. It should be administered in some fatty or oily matter, and from one-half to one teaspoonful of sweet-oil or linseed-oil would be right. The drug should be given an hour or more before the first meal of the day, and for two or three mornings, or until worms are expelled. Then an interval of several days should be allowed to elapse, and the dosing be repeated if thought necessary.

When puppies are about three months old it will likely be safe to administer at a dose twice the quantity of santonin that was proper in the fifth or sixth week.

If the bowels do not move freely after santonin has been given for several

days, and a laxative seems necessary, sweet-oil or castor-oil will be suitable. To administer such, however, two or three hours after every dose of the drug, as some writers have advised, would not be wise, for *santonin* acts slowly, and if hurried out of the system by a cathartic it could not have the desired effect. Furthermore, when either of those oils is given with it the quantity should not be over one-half that required for cathartic action.

After puppies have passed the fourth month, for general use about the safest and most reliable vermifuge is *areca nut*, provided they are fairly well and strong. This, the fruit of an East Indian tree, loses its effectiveness on keeping, hence the young and fresh nuts, which are light colored, should be chosen. They should also be powdered only as required; and that can be done on a common nutmeg-grater.

After the age stated a very nice adjustment of doses of *areca nut* is not necessary, and to puppies four months old, of such breeds as setters and collies, also of the largest breeds, an *even* teaspoonful may be given. For fox-terriers, pugs, and the like, the dose should be about one-half, and for toy-terriers, one-fourth of an even teaspoonful.

When *even* full an ordinary teaspoon holds about sixteen grains of powdered *areca nut*; and it is measured in this way: Take up a heaping teaspoonful of the powder, and with a card, or the straight back of a knife-blade, sweep off all above the edges of the spoon.

When necessary to give one-half or one-fourth this quantity, pour an even teaspoonful onto a plate, and with a knife divide it into two or four piles of uniform size.

Now and then it may seem advisable to try *areca nut* on puppies considerably under four months of age, other remedies having failed. In such event the doses should not be over one-half those advised after the fourth month. For example, assuming that the puppies are setters or collies, or of largest breeds, and about two months old, the dose for them would be about eight grains; for fox-terriers, four grains; for toy-terriers, two grains.

When the sixth month is reached the dose for toy-terriers may be about one-half greater than at the fourth month, or six grains. With these toy breeds thereafter the increase should be slow and not considerable; six grains being quite enough for them until about the eighth or ninth month, when the dose may be eight grains. Further increase after that age might not always be safe.

For fox-terriers and puppies of breeds of similar size, the doses may be increased by about one-fourth of the first every third month after the fourth. For example, at that period it is one-half an even teaspoonful or eight grains. Then about the seventh month it would be three-fourths of an even teaspoonful, or twelve grains; the tenth month, an even teaspoonful, or sixteen grains; while once fully matured they may safely be given about one even teaspoonful and one-half.

For puppies of all varieties of medium size, as collies, the dose should be increased by one-half a teaspoonful every second month until the sixteenth month has been passed; that is, commencing about the fourth with one teaspoonful, or sixteen grains; after the sixth month it should be one teaspoonful and one-half; the eighth, two teaspoonfuls; the tenth, two and one-half; the twelfth, three; the fourteenth, three and one-half; the sixteenth, four; and this should be the dose thereafter.

In adjusting the doses for the largest breeds the same method of increase should be instituted; that is, commencing with one teaspoonful after the fourth month, if this dose is increased by one-half a teaspoonful every second month, in the sixteenth it will be the same as for medium-size breeds. But the increase should be persisted in, and in the same ratio, until after maturity; which is scarcely reached before the twenty-fourth month. In other words the dose after the eighteenth month will be four and one-half teaspoonfuls; the twentieth, five; the twenty-second, five and one-half; and the twenty-fourth, six.

The reader is reminded that the basis of these estimates is an *even* teaspoonful.

The doses recommended are of moderate and even small size, that they who direct treatment may be within the safety lines always. It is true that larger doses might often be given without harmful results, but when the patient is a puppy it is certainly better to give a fairly small dose and repeat on the following day if necessary, than rely on a single large dose.

When giving areca nut to quite young puppies the best medium is milk; but the quantity should not be more than a tablespoonful, for everything in the way of medicine must be poured down their throats.

For puppies more than six months old, also for mature dogs, this worm-destroyer is best given in the form of a bolus or large pill, which is made as follows:

Place the required quantity of powder on a plate and drop onto it two or three drops of molasses. After mixing thoroughly by means of the tip of a table-knife, take up the entire mass on the end of the knife and dip it into dry wheat flour. Now remove it with the fingers and roll it into a ball, using more flour as necessary to prevent it sticking to them during the operation.

When the subjects are old enough to catch and gulp a piece of meat, a convenient method of giving the powder is to envelop it in a very thin slice or shaving of meat, and toss it to the patient after he has been teased in like way with a few such toothsome morsels.

If the dose to be given is large, it will be advisable to divide it and use several small slices of meat, rather than a single large one.

Allowing one or two hours for the powder to do its work on the worms, the intestinal canal should then be swept out, as it were, by means of a cathar-

tic; and although a few breeders of wide experience are prejudiced against castor-oil, there is really nothing better for mature dogs and puppies after the third or fourth month; while for younger puppies sweet-oil is quite active enough.

Previous to administering worm-medicine, food should be withheld for as long a period as safe, that the intestinal canal may be well emptied, and the drug come in direct and as close contact as possible with the worms. Where the puppies to be treated are nursing, an interval of two or three hours must suffice. If the patients have recently passed the fourth month, a light supper of milk, the vermifuge early the next morning, oil an hour later, and breakfast about an hour or two after that, may be the rule.

Paralysis caused by worms may properly be alluded to here.

It is a very serious condition, and while in some cases recovery occurs, such fortunate result is not common, even under the very best of treatment.

Obviously the first essential is the removal of the cause—expulsion of the worms. That effected, in occasional instances the paralysis will speedily disappear; but if some improvement is not soon manifested, the outlook is far from encouraging.

The victim should be well nourished, with easily digestible food; and if he is losing flesh, cod-liver oil ought to be given.

It is an open question whether he should be confined to a very limited space or allowed to try to drag himself about. Experience teaches that the former course is the wisest, because of the irritability of the affected nerves; therefore for at least ten days he should be kept in a barrel or small, deep box.

After close confinement for about that length of time, he ought to be lifted out and encouraged to try to walk. If improvement is not plainly evident, a perfect rest of another week in his barrel or box would be advisable. Then he should be put into roomy quarters, and have a bed on the floor, that he may move about as he likes.

If there has not been any considerable gain, the usual treatment for paralysis should now be applied; but the chances of success will be few indeed.

CHAPTER II.

TÆNIA.

THE tænia or tape-worm is made up of flat whitish segments, resembling small bits of tape, and these are joined together, end to end. It has a very minute head, provided with either suckers or tiny hooklets, or both, by means of which it attaches itself to the mucous membrane that lines the intestine. Once firmly fixed to that, segment after segment is formed, by a process of budding, as it were; and all on reaching the complete state are provided with both male and female generative organs. Thus the segments multiply, and the chain lengthens; also increases in size.

They remain joined until fully matured; then break off, each producing a vast number of eggs, which contain the embryos or germs.

If the eggs in question enter the stomach of a suitable animal, their envelopes or shell coverings, softened by the gastric juice, are ruptured, and the embryos set free.

These embryos then leave the digestive canal and make their way to different parts of the body, where they meet with conditions favorable to their development. Now let them be introduced into the intestinal canal of another animal of the right sort, and they fasten themselves to the lining membrane, as in the first instance, and another colony of tape-worms is formed.

Likely this method of transmission can be made clearer by illustration. It is assumed that a tape-worm egg has passed out of the bowels of a dog and been taken into the stomach of a sheep, possibly in the drinking-water. Leaving the stomach and probably entering circulation, it eventually reaches the brain, where it becomes fixed, and known as the *cœnurus cerebrialis*. Now if this infested brain be eaten by a dog, in him, from the larva or immature form of the tape-worm contained therein, will be developed a perfect tape-worm.

Another method of propagation is as follows: Segments of a tape-worm are passed by an infested dog, or they work their way out of his bowels and locate themselves among the hairs of his coat, where they deposit their eggs. If he is so unfortunate as to have lice, the tape-worm eggs are swallowed by them. Within the bodies of these lice the eggs in question meet with the conditions which are right for the rupture of their envelopes or shells. That change occurring, the embryos are set free, and another transformation has taken place. Now the vermin excite itching in the dog, and set him to scratch-

ing and biting. While endeavoring to find relief by the latter means he is quite sure to swallow some of the disturbing lice which hold the young embryos. Thus the latter are returned to and redeveloped into perfect tape-worms in the very intestinal canal which they left as eggs but a few weeks previous. Through this method of transmission an animal may continually reinfect himself, or by depositing in the kennel the lice containing the embryos, or shaking them from his coat into the drinking-water or food, they may be introduced into the bodies of other dogs; and they in turn become infected.

Bothriocephalus latus, commonly known as the fish tape-worm, is the largest internal parasite which dogs harbor. But while they are not exempt from this infliction, fortunately they do not often suffer from it, their escape being, possibly, due to the fact that the kinds of food in which its embryos are very generally located are not popular with them; hence it is but seldom a part of their diet. It is rare in this country, and in Europe is common only in countries bordering on inland lakes and seas. The length attained is often from twenty to thirty feet. The head is almond-shape, and nearly one-twelfth



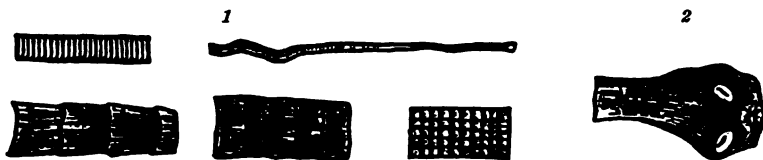
Bothriocephalus Latus. — 1. Portions of the worm, of natural size. 2. Head magnified.

of an inch long; while its diameter is from one-fourth to one-sixth of an inch. The segments differ quite decidedly from those of other tape-worms, being much broader and shorter. The ova are also larger than those of the pork or beef tape-worms; but their shell-covering is thinner, and it has a sort of lid at one end. They develop only in fresh water; and, swallowed by pike and other fish, change into cysticerchi, in the muscles, peritoneum, and solid internal organs. Evidently, therefore, man, the dog, and other victims take in the embryos while eating fish that is "measly," raw, or but only partially cooked. This tape-worm is a much greater tax upon the host than most parasites of its kind, and infested dogs very generally lose weight quite rapidly, and ere long are reduced to "skin and bones." Fortunately, however, it is more easily removed than smaller and more delicate worms, for there is less liability of its being broken and the head left behind.

Tænia Solium is also less often found in this country than in Europe. It ranges from six to thirteen feet in length. The head is of about pin-head size, rounded, and attached to a thread-like neck. This parasite develops in the small intestine, from embryos contained in raw or only partially cooked "measly" pork, consequently it is properly termed the pork tape-worm. The term *solium* would indicate that it invariably existed singly, but that is not so,

although usually the case. Man and the dog are its hosts, but the latter, in this country certainly, is of the two the most fortunate. The segments are constantly maturing and being expelled in the discharges from the bowels; and it has been estimated that were the head to remain in an intestine, as many as eight hundred segments would be developed and cast off by this worm before its reproductive power became extinct. Those segments are about two-fifths of an inch in length, and from one-fourth to one-third of an inch in breadth.

Tænia Marginata is the largest of the various tape-worms which are common in dogs, and may attain a length of ten feet. Owing to quite a close resemblance, it has often been confounded with the *tænia serrata*; yet it is a larger worm, and presents decided peculiarities about the head. The list of its victims includes sheep, goats, and many other ruminants, also swine, monkeys, and squirrels. Man may be infested by it, but only while it is still in the immature or cysticercal condition. The larvæ of this worm are sometimes found in the livers of the animals mentioned, enclosed in cysts or sacs about the size of American walnuts; but they exhibit a decided preference for serous mem-

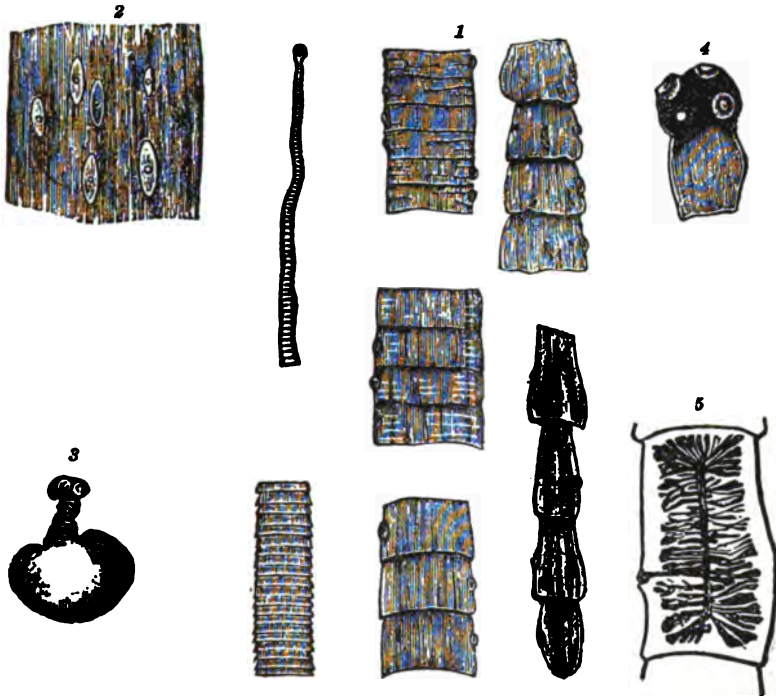


Tænia Solium. — 1. Portions of the worm, of natural size. 2. The head magnified.

branes. Evidently dogs having access to slaughter-houses are quite sure to soon become infested by this species of tape-worm; while the eggs scattered about by those dogs produce the so-called bladder-worm in the unfortunates who acquire them; and this often proves fatal because it cannot be reached by medicine.

Tænia Saginata or *Mediocanellata* in general appearance somewhat resembles the *solium*, but the head is larger. The segments also are larger, thicker, and stronger. When matured it is from twelve to twenty feet long. The head, about one-twelfth of an inch in diameter, is flat, and, unlike the heads of most tape-worms, it has no hooklets, but possesses sucking disks only. This is a beef tape-worm, and infection is attributable to eating raw or only slightly cooked flesh of ruminating animals, as the ox, sheep, goat, etc., in the muscles of which the embryos are located. They are also to be found in some of the internal organs. After being detached the segments exhibit a crawling motion, which might lead to the supposition that they were individual parasites. As a result of this peculiarity they often make their way out of the body; and the number of segments which thus pass spontaneously and are expelled in the discharges is very large, so rapid is the reproduction and growth.

Tænia Cœnurus is the product of the *cœnurus cerebralis*, which, in the brain of sheep, gives rise to the disease known as turnside, so called because the affected animal moves about in a circle. This tape-worm, which springs from it, is usually about fifteen inches long, but it has been known to attain a length of over three feet. While sheep are the common source of the larvæ, none of the ruminants are exempt; and although the brain is very generally affected, the larvæ have been, in very rare instances, found in the spinal cord.



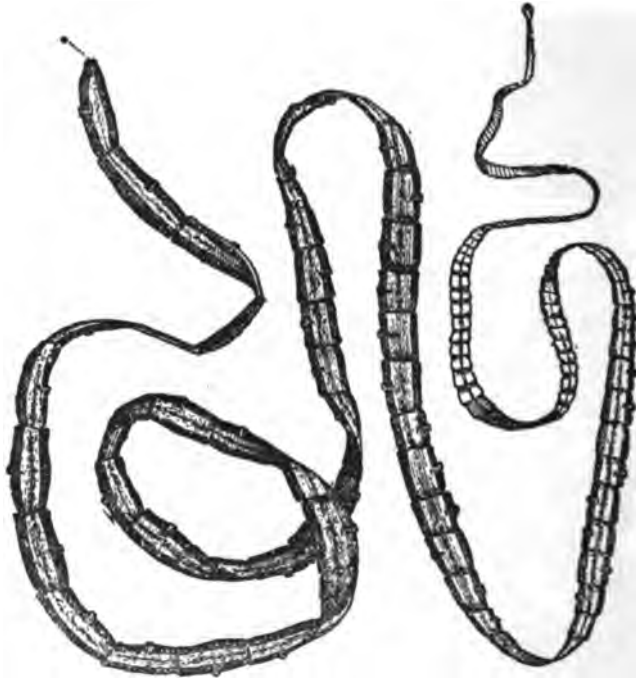
Tænia Saginata. — 1. Portions of the worm of natural size. 2. A number of cysticerci, from which the tape-worm is developed, of nearly natural size, situated in the fibres of a muscle. 3. A magnified cysticercus, with its head and neck protruded. 4. Head of the worm magnified. 5. Fully grown joint of the worm.

The head of the parasite is small, of pear-shape, and provided with sucking disks as well as hooks.

Tænia Serrata, so called because the margins of its body are serrated like the cutting edge of a saw, when fully mature is from two to three and one-half feet in length. Evidently it belongs to the same species as the *solium*. Sporting dogs are quite frequent victims, and infested through eating the entrails of hares and rabbits. When the eggs of the parasite are discharged from the intestines of dogs and taken up by sheep they develop into the

cœnurus cereбрalis. Manifestly, therefore, were a dog harboring this worm to be kept on a sheep-farm, he would be a grave menace to the flock.

Tænia Cucumerina is the most common tape-worm of the dog. It is of reddish-white color, from four to sixteen inches in length, and has a very small head and long and slender neck. The segments or joints are elliptical, hence the name *tænia elliptica* sometimes applied. At first very narrow, they gradually broaden; and because of their being rounded at the corners, and shaped somewhat like cucumbers, the worm was given the name by which it is com-



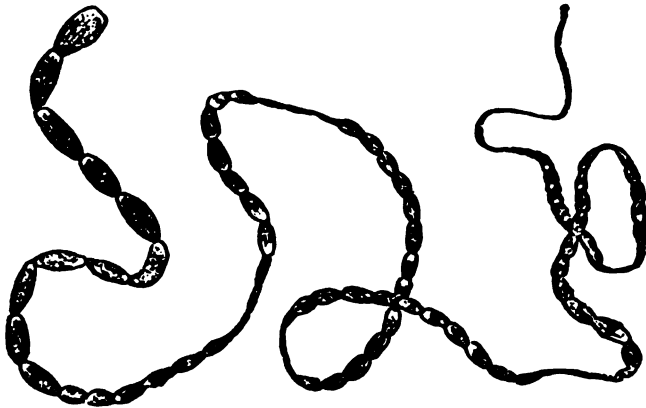
Tænia Serrata, natural size. (Von Siebold.)

monly known. When fully matured and abounding in eggs, the segments break from the line or chain on which they have formed. Remaining within the small intestine for a long time as independent worms, they eventually crawl down through the large intestine and out of the body, or are ejected with the waste matters.

These segments are deposited about the quarters of the dog from which they come,—on the floor, in the bedding, etc.,—and not a few of them are taken up by him on his coat. Retaining for a time their vitality and power of motion, they crawl and wiggle about among the hairs, and deposit therein ripe eggs, with which each one is heavily freighted.

This worm is occasionally found in children, and less often in adults. The reason assigned for its greater frequency in the former is their more intimate relation with the dog and cat, it being thus implied that they become infested through those pets.

Tænia Echinococcus is the smallest tape-worm found in the dog. It is about one-fourth of an inch in length, and usually made up of three segments, including that of the head, but occasionally there are four. The term "hydatid" is applied to the larval or bladder-stage of this parasite. The fertilized eggs are contained in the last segment, which in time softens and disintegrates. If, after being discharged from the intestines of the dog, these eggs, either free or still in their segments, enter the stomach of a suitable animal, their thick fibrous capsules or shells are digested by the gastric juice, and



Tænia Cucumerina, natural size. (Von Siebold.)

thus the embryos are set free. All are provided with six hooklets, with which they attach themselves to the walls of the stomach. Through them they bore with ease. They are believed to sometimes enter the liver by way of the bile-ducts; but generally they are carried through the blood-vessels and lymphatics to different parts of the body, and especially to the internal organs. Finally stopping, they undergo further development by a process of growth and metamorphosis into the characteristic bladder-cysts, which may be as small as a pin-head or as large as the head of a child. In its strobila condition this parasite is said to infest only dogs and wolves. The former are regarded as practically the one source of hydatid disease. Certainly their opportunities of becoming infested are good and constant. It is also a notable fact that the extent of the hydatid disease depends very largely upon the number of dogs in the community. Besides harboring mature tape-worms of this species, the dog may serve as an intermediary host and convey the ova to man. The eggs may

be in the hair of his head, and even on his mouth and tongue, having been taken up and deposited there while he was searching among refuse for bones and stray tidbits, many of which are likely carriers of the ova. It follows, therefore, that lovers of dogs ought to be considerate in intercourse with their pets; and surely not allow them to kiss or lap their faces, or even their hands, — because they are so often at their own lips, — nor take dainty morsels from their plates, or indulge in like questionable habits. Hydatid disease, the penalty, is very serious, and often terminates fatally.

Not all tape-worms that dogs may harbor have been described herein, because quite frequently such worms are encountered, which, while they may bear a close resemblance to some of the foregoing, yet present decided peculiarities which constitute positive proof that they are not identical. Furthermore, in these animals tape-worms are by no means rare which cannot be classified, because they differ in some respects from the tape-worms with which man is familiar, although he has opportunities to study the internal parasites of ruminants, dogs, and many other living things as well as those of his own race.



Tænia Echinococcus,
magnified 12 times.
(Graham.)

From this brief consideration of some of the various species of tape-worms and their different sources, it is plainly evident that dogs should not be admitted to killing establishments; also that all their flesh foods that are not absolutely above suspicion ought to be thoroughly cooked. First in the suspected class are the entrails of game and poultry and heads of sheep, also the paunches, livers, and other internal parts of these animals, and of all cattle. And since lice and fleas, and possibly other insects, play an important part in the transmission and propagation of the tape-worm, it is plainly evident that the dog

and his kennel should be kept thoroughly clean, and as free as possible from all vermin; also, that while such preventive means are faithfully employed there can be little if any occasion for the use of vermifuges.

Tape-worms do not give rise to any symptoms which can be considered characteristic; that is, symptoms which plainly indicate their presence and are unmistakable. That a dog is harboring one of these parasites may be accepted as undeniable only when detached segments or joints are found in the discharges from his bowels; and such evidence is not long withheld after a dog has become infested. But the fact must not be overlooked that segments in the intestinal discharges are not always noticeable, because some are so small and others so delicate they easily escape the eye even during careful examination; while it is doubtful if such parts of all the various kinds of tape-worms are thus thrown out spontaneously.

If the appetite of a dog is voracious and he seems strong and in apparently good health yet poor in flesh, and does not gain under good management and generous feeding, the presence of a tape-worm may rightly be suspected, and a vermifuge given even if segments are not found in the intestinal discharges. It may also be accepted as safe to administer the same, considering the prevalence of tape-worms, when dogs manifest vague and ill-defined symptoms, or, in other words, appear generally out-of-sorts, and the cause of the trouble cannot be determined; because if properly chosen a worm-destroying drug could not do any harm even did it fail to do good.

But while tape-worms do not betray their presence by positive and unmistakable signs, now and then, besides the indications already mentioned, they sometimes give rise to constipation, — which is quite significant if it alternates with diarrhœa, — to salivation or very profuse flow of saliva, poor appetite, followed in time by a voracious appetite, dulness and disinclination to make much exertion, absence of buoyancy of spirit, and a disposition to snap and snarl, seeming weakness, itching of the nose and outlet of the bowel, and sleep evidently disturbed by bad dreams. All these may be induced by tape-worms. A falling off in the coat is also a common consequence; it losing its natural softness and lustre, and becoming dry, rough, and staring.

Considering the nature of eczema and the conditions which favor its development, it is easy to believe that in a dog harboring a tape-worm this disease is especially liable to occur as a complication; and if so, it is sure to prove very obstinate until the parasite is expelled. Vomiting shortly after eating is a sign of worms of some significance when associated with other symptoms; so, too, is an unusual thirst.

In young puppies the effects of worms on the nervous system are most pronounced, and frequently complete loss of power in the hind legs is due to their presence. Less often, but still cases are by no means rare, in mature dogs paralysis of those parts is caused by tape-worms. Convulsive attacks also occur in consequence of them, with about the same relative frequency.

A cure of tape-worm can only be complete when the head is expelled, for as long as that remains the worm will continue to grow; therefore, after treatment has been administered, the discharges ought to be closely examined in the following manner: Carefully remove the intestinal discharges from the floor and drop them into a basinful of water. Gently shake the same to separate the worm from the waste matters; then allow it to stand for ten or fifteen minutes, during which the worm should sink to the bottom. Next pour off as much of the supernatant liquid as possible, refill the basin with water, and repeat this process again and again, until the solid constituents have all been dissolved and washed away, and the water remaining is nearly colorless. Then possibly, if present, the head will be found.

Let it be remembered that not often is it larger than the head of an ordinary

pin, also that it is attached to a very slender neck, which broadens gradually to mature segments of full size.

Although the head of a tape-worm may now and then be found, considering its smallness it easily escapes notice; moreover, the parasite often dies, consequently its hold on the lining membrane of the intestines is broken, and the head is carried downward out of the body with the waste matters, while many of the segments remain behind. Therefore, were the head not found, it would be too much to infer that the treatment was not successful. If, however, after several weeks had elapsed, segments again appeared in the discharges, they could rightly be accepted as proof that the treatment had not been effectual, and the head was still in the intestine.

In view of these facts, whether or not tape-worm treatment should be soon repeated in event the head is not found must depend upon the existing conditions. Did marked improvement in all the symptoms occur, it would be advisable to delay; but in event the signs of tape-worm persist, together with disturbances believed to be due to it, and the dog or puppy seems in danger in consequence of them, then to at once repeat the treatment would be right.

Sometimes a worm medicine is given without any noticeable effect, such as the discharge of small and immature segments. In cases of that sort it might not be unreasonable to infer that the remedies which had been administered were too mild in their action; and did the patient seem healthy, strong, and vigorous, thus well able to bear the dosing, it would be expedient to try some other vermifuge in the course of a week. Such robust patients also would doubtless be able to bear still another treatment during the third week. If so, it ought to be administered did any marked signs of worms remain after the second dose, but not otherwise.

After "worming treatment" the intestinal discharges should be examined from time to time for segments. If none appeared in them during the subsequent two or three months, the caretaker could confidently assume that his treatment was a success, and the head had been expelled, even had he failed to find it; because had it been left within the intestine the worm must have reproduced itself, again reached maturity, and its ripened and detached segments begun to come away.

To repeat treatment for tape-worms the second, and, indeed, the third time during successive weeks can scarcely prove unwise even in doubtful cases, provided always the subjects are robust, in view of the very important fact that very often the same dog harbors several tape-worms, — and may be of different species, — in which event all would not likely be driven out by one dose of worm medicine unless it was exceptionally large or powerful.

This suggestion, that a dog may be infested by several tape-worms, calls to mind an interesting case in man, recently reported, which demonstrates a surprising possibility. The subject was a marine engineer, who acquired the

tæniæ while at Madagascar. Under treatment he passed three worms, the united length of which was one hundred and seventy yards, and the weight nine hundred and twenty-two grains.

The head of the tape-worm is so minute in size it is easily shielded from the action of vermifuges by the thick and tenacious mucus, which is always secreted in excess when such parasites are present. The small hooks, also, which are on the heads of most tape-worms, are generally so obstinately and firmly fixed to the lining membrane of the intestine that to make them break their hold is never easy; while with some worms it is exceedingly difficult.

Manifestly for treatment to promise success the conditions must be favorable; and especially important is it that the head be completely uncovered. It is advisable, therefore, to make it a rule to institute preparatory treatment for at least one week before worm-medicine is to be given; the special purpose of the same being to combat the secretion of mucus, and have the head as nearly bare and unprotected as possible.

To the desired end, for about the length of time stated, if the subject be full grown or a puppy well on toward maturity, the diet should be restricted to raw beef, and milk or broths thickened with a few well-toasted bread-crusts. It should really be of the "starvation sort," provided of course it can be safely borne, the subject being fairly strong and hardy.

Under such restrictions in diet the mucous secretion should be greatly lessened, and perhaps sufficiently reduced; but still those who can conveniently do so ought to administer the following while the dog is under the low diet:

Chloride of ammonium, two drachms; fluid extract of senna, six drachms; water, sufficient to make three ounces. Dose, one teaspoonful twice daily, between feedings.

This dose is appropriate for breeds of medium and largest size; while for fox-terriers and the like it should be one-half a teaspoonful; and for toy terriers, one-fourth of a teaspoonful; which quantity is about fifteen drops.

The preparatory work having ended, the night before the worm-destroyer is to be administered, and several hours after a very light supper, — of a little milk or thin broth, — a goodly dose of Epsom salts should be given. For largest breeds it may be one tablespoonful; medium size, three teaspoonfuls; dogs of about the size of fox-terriers, two teaspoonfuls; and a little less than one teaspoonful for toys. It will be necessary to force it into the patients, because of its unpleasant taste and the quantity of water required to dissolve it.

This cathartic is advised because it expels more of the mucus than any other like agent, and thus leaves the head of the worm more exposed to the toxic action of the vermifuge.

If the dose of salts administered at night does not act, another must be given soon after daylight comes.

The following morning, the bowels having been thoroughly evacuated, and thus the tape-worm uncovered, as it were, the vermifuge ought to work to good advantage.

Areca nut will oftentimes expel the tape-worm, and some authorities appear to prefer it to the generally accepted tænicides; but there are other agents which seem to be rather more destructive to this species of the worm, and the most popular among them is the oleoresin or oil of male fern.

This was the secret remedy of Madame Nouffer, the widow of a surgeon in Switzerland, who by successful use in cases of tape-worm acquired celebrity so great that the interest of the medical profession of Paris was aroused; and after being satisfied that its merits were all that had been claimed for it, the king of France purchased the secret, and by his order the same was published, and thus given to the world. Madame Nouffer's plan of treatment was to administer a goodly dose of the powdered root of male fern, and follow it in two hours with a generous cathartic; and this process she had repeated again and again if necessary, at proper intervals, until the worms were expelled.

Returning to the treatment of tape-worms in dogs, when the oil of male fern is to be used, and one dose only of it is to be given, the subject to be treated is of medium or largest size breed, and six or eight months old, for such, a safe dose is sixteen drops; for fox-terriers and the like, eight drops; and for toys, four drops.

For all varieties excepting toys, the dose of the oil of male fern ought to be increased by one-half after the twelfth month; while with the largest breeds another and similar increase should be made after the twenty-fourth month.

The writer cannot advise that it be given to very young puppies, yet one of the most successful breeders of Irish setters has assured him that he has often administered it to little ones only a few weeks old without any ill effect; the dose being two drops in one teaspoonful of castor-oil.

While the popular treatment by male fern consists in giving one dose only, with all, and especially young subjects, it would be better to administer the remedy in divided doses and at short intervals.

If this novel plan be decided upon, the quantity to be administered ought to be about one-fourth more than that which has been already advised for one dose; furthermore, it should be divided into about fifteen doses.

The usual preparatory treatment having been first applied, one such small dose should be given every five minutes, until the last has been taken; and if the bowels do not then move in the course of two hours, action should be encouraged by means of a medium dose of castor-oil.

While male fern alone is quite destructive to tape-worms, when combined with calomel it is still more deadly; and there can be no valid objection to the use of this mercurial if the mixture be divided up into very small doses, and one dose be given every five minutes, after the method just advised.

When the patients are not less than six months old, and of medium or largest size breeds, whether the medicine is to be in one dose or in divided doses, the right proportion of calomel would be five grains. For smaller subjects excepting toys, the dose should be three grains; and for those little ones, one grain.

As for the quantities of male fern that ought to be employed with the calomel, they may be the same as those which would be right if the oil was to be used alone. For example, with mature dogs of medium size, and the dose to be one only, as advised in the foregoing, it should consist of twenty-four drops. Or were the oil to be given in small doses, and one every five minutes to be the rule, then the entire quantity would be thirty drops; and it would be the same were the male fern to be administered with calomel.

Calomel stimulates the intestines, and by the action excited, their contents are being constantly moved downward, so that shortly after the last dose has been administered the tape-worm is often expelled without the aid of castor-oil or other cathartic.

Another happy combination is areca nut and male fern, more destructive to the tape-worm than the latter alone. For mature dogs of the largest breeds, the right dose is one drachm of the former and one-half a drachm of the latter. For dogs of breeds of medium size the proportion should be about forty grains and twenty drops; for dogs about the size of fox-terriers, twenty-five grains and ten drops; and for toys, eight grains and four drops.

Male fern, a very disagreeable oil, may be given while floating on milk, but it is best to enclose it in capsules; for aside from the administration then being easy, there is much less danger of its causing vomiting. Invariably it ought to be followed, in the course of one hour and one-half or two hours, by a generous dose of castor-oil if the bowels do not move.

The question as to essential quantity of castor-oil may disturb some, hence the advice that for puppies six months old and of medium or large size breeds it be one tablespoonful; for fox-terriers and the like, one-half a tablespoonful, and for toy terriers, one teaspoonful; while for all mature dogs, doses twice as large would be right were the subjects strong and hardy.

Combined with jalap, areca nuts acts better in cases of tape-worm than alone; and it can be rendered still more powerful and destructive by the addition of santonin; also without safety being at all impaired. When given together, the proper proportions of each are as follows:

Areca nut, forty grains; santonin, three grains; compound powder of jalap, ten grains.

This may be made into one or two large pills or boluses, or given in milk. It is one dose for a dog of medium or large size, and one-half would be right for dogs of about the size of fox-terriers. As for toy terriers, there are other remedies better adapted to them.

Mr. Sewall, the English authority, recommends for tape-worm the following combination, which may be justly termed a "shot-gun mixture," for it must scatter and hit the mark somewhere, and likely in several places :

Powdered areca nut, one drachm ; oil of male fern, one-half a drachm ; santonin, four grains ; croton-oil, three minims ; olive-oil, one ounce.

This is considered a dose for a strong and healthy St. Bernard and dogs of similar size ; while two-thirds of it is recommended for a collie and the like ; and one-fourth for a fox-terrier and others of about his weight. For toys it would be rather too powerful ; nor should it be given to puppies.

The croton-oil in this, and the jalap in the santonin and areca nut mixture, ought to move the bowels freely, but if not, they must be followed by castor-oil in the course of two hours.

Often there are round-worms with tape-worms in the same intestine ; and it is in such cases that these combinations of powerful vermifuges and purgatives have their happiest effects.

Recently naphthalin has been highly recommended as a tape-worm destroyer ; some authorities who have used it extensively believing it to be superior to all other remedies, both in the certainty of action and absence of any poisonous effect. To puppies six months old or over, of medium and largest breeds, also to mature dogs of the same breeds, after a day of fasting, ten grains can be given in one tablespoonful of castor-oil. Where the subjects treated are puppies, a second similar dose — that also in like quantity of castor-oil — ought to follow in the course of half an hour ; while to all mature dogs it would be advisable to give three such doses, — all with oil, — and this interval be allowed between each. For fox-terriers and others of about their size, the dose of naphthalin may be seven grains ; and about four grains would be right for the toys. Given to the former, each dose ought to be in one-half a tablespoonful of castor-oil. With toys, as well, this remedy should be in oil, but the quantity of it ought not to be more than one teaspoonful. To these little ones, as to puppies of medium or largest size breeds, two doses should be administered, and the interval between each be about half an hour. After waiting three or four hours for the bowels to move, and they failing to do so, it would be well to stimulate them with castor-oil, and employ about the same quantity that had been given with each dose of the naphthalin.

Chloroform alone acts exceedingly well in many cases of tape-worm ; and its good effect is intensified when combined with croton-oil.

Being highly irritating, in giving chloroform to dogs it must be in some viscid liquid which will prevent this ill effect, as mucilage, syrup, yolk of egg, etc. Were the ingredients at hand and the chloroform and croton-oil mixture to be prepared at home, the yolk of an egg should be beaten until light, then those drugs added, and all be quickly put into a bottle several times larger than actually required, that it may be shaken before use.

For dogs of medium or largest size breeds, the proper quantities to be mixed with the yolk of an egg, as advised, are chloroform, forty drops; croton-oil, one drop. Or were the dog to be treated about the size of a fox-terrier, one-half this would be right; while one-fourth would be quite enough for a toy.

There is on sale with druggists the so-called Chloroform Mixture, which it would be wise to obtain when these drugs are to be tried. Having been freshly prepared, to two ounces of it, two drops of croton-oil should be added. This quantity will then constitute two maximum doses, and of course to a dog of medium or largest breed, one-half of it — which is about two tablespoonfuls — could be given; one-fourth, or about one tablespoonful, to a fox-terrier or his like; while for toys, the dose of this mixture would be two teaspoonfuls.

Chloroform and croton-oil ought always be given at night, after a fast of from twelve to twenty-four hours; and did they not purge, on the following morning a generous dose of castor-oil should be administered.

Unless the dogs were quite robust it might not be advisable to give croton-oil, but better to rely on chloroform alone, and in divided doses. For twenty-four hours the diet ought to be very low, or there be a complete fast. At the expiration of that period a generous dose of Epsom salts or castor-oil ought to be administered. When it has acted freely, two tablespoonfuls of the chloroform mixture should be given, and followed, in the course of an hour, by another like dose of that mixture. Its effect is often purgative, but did the bowels not move in two hours, they should be made to do so by means of castor-oil.

Two tablespoonfuls of the chloroform mixture constitute a fairly small dose, and it can be safely given to dogs of medium as well as of large size breeds; and likely it would be safe to give one-half more, or possibly doses twice as large. But still it is best always to be very conservative in using medicines, and at least commence treatment with medium doses; then if they fail, and have not caused any unpleasant symptoms, they can rightly be increased to a reasonable extent.

For fox-terriers and the like, a medium dose of the chloroform mixture when it is to be repeated would be one tablespoonful; while for toys, it should be two teaspoonfuls.

Some puppies are acutely sensitive to the effects of medicines. Considering this, also the peculiar action of chloroform, it would not be advisable to use it on them unless they were quite old and nearly matured.

From time to time additions are made to the list of tape-worm remedies, and among the recent is salicylic acid. Considering that treatment by this means must occupy much time and necessitate considerable trouble, manifestly it can never be popular. However, it is described herein that it may be resorted to if necessary, in particularly obstinate cases which may have resisted

other measures. Were this given a trial, the number of doses ought to be about five. After a fast of at least twenty-four hours, the same ending at night, a generous dose of castor-oil should be administered. As early as possible on the following morning the real treatment should commence with a dose of the salicylic acid, and persist until five doses have been given, with an hour between each; and the last be followed, in the course of an hour, by a medium dose of castor-oil.

Were the dog to be treated full grown and one of the largest breeds, each dose might consist of twelve grains; in which event the entire quantity taken would be sixty grains. For mature dogs of medium size, the dose would be ten grains; and for fox-terriers and the like, six grains. As for toys, this agent cannot be recommended because of certain peculiar effects; nor would it be advisable to administer it to puppies unless they were of advanced age.

There seems firm ground for the belief that papäin deserves a place among the drugs of great assistance in the removal of tape-worms. But unfortunately it is very expensive; moreover, much of it on the market is nearly or entirely inert. Yet from reliable chemists a good quality ought to be obtainable. In what way it is unfriendly to these parasites is not known. Evidently it causes the heads to relax their hold on the intestinal lining, and doubtless this is the result of some quality which is poisonous to them, for several expelled by it have been found stupefied, but were restored and commenced to uncoil when hot water was poured over them.

Papäin, although of vegetable origin, has properties similar to those possessed by pepsin and pancreatin. It should be given three times daily. The dose for dogs of medium size and largest breeds is ten grains; for fox-terriers and the like, five grains; and for toys, three grains. Each dose can properly be given in half a teaspoonful of glycerin and two teaspoonfuls of water. For the reasons assigned, papäin cannot be a popular remedy, nor indeed other than a remedial curiosity; but still a discussion of tape-worm destroyers could not be complete were not at least bare allusions made to this and similar agents.

The oil of turpentine, which acts best on worms in the stomach, in doses of sufficient size either kills or so weakens the tape-worm that it relaxes its hold, and is carried downward and out of the bowel. It is safe when properly employed, and yet capable of grave injury; hence cannot be recommended for general use. Being highly irritating, it should always be administered in some other oil or thick liquid, or in the form of emulsion. The oil might be olive or linseed, or even castor-oil. It were better, however, that the last be not combined with it, but held for use about three hours after the turpentine has been taken and had opportunity to do its destructive work. An emulsion can be made by putting the quantity of turpentine to be used onto a plate with a goodly amount of powdered acacia, and rubbing them up until they are well

mixed; then add to half a cupful of milk and shake well. But the most convenient method of masking its irritating properties is beating the required quantity up with the yolk of an egg.

In excessive doses turpentine is deadly poisonous, and unfortunately it is not possible to tell just where the safety-line lies. Were one dose to be relied on and the dog fully matured, also of very large breed, the dose ought not to exceed two teaspoonfuls. This, furthermore, should be beaten up with the yolks of two eggs, and given in a cupful of milk.

An even safer method would be to employ this remedy in divided doses, which for such a dog ought to be one-half a teaspoonful morning and night, for about three days.

For dogs of medium size, this dose similarly repeated ought not to be excessive; for fox-terriers, however, and others of nearly their size, twenty drops would be near right. As for toys, there are other and better remedies.

It will be noted, and perhaps occasion some surprise, that in graduating doses of vermifuges but little distinction has been made between puppies of the medium and largest size breeds. While in some instances variations can be made, with propriety, on the basis of size, great ones and nicety of adjustment are not invariably required with worm medicines; for no very marked difference exists between the alimentary canal of a puppy of medium sized variety and that of a pup of large breed. Certainly it is not very much larger nor longer in one case than in the other; and assuredly the difference in capacity counts for but little. Moreover, such medicines are intended for the tenants, not their hosts; consequently unless very powerful drugs are given — drugs that are largely absorbed and taken into circulation — until matured a setter may be given about as much as a St. Bernard of the same age. But the latter, maturing less early, will bear several more increases than the setter, and until he in turn has reached maturity.

Excluding small dogs, for the reason that many of them are of notoriously delicate constitutions, the age and condition of strength are the considerations that should weigh most when estimating doses of worm medicines of the nature of those herein recommended.

The prevalence of worms and dangers of infection must manifestly be greatly decreased where the discharges which follow the use of vermifuges are disinfected, buried, or burned, and the kennels in every instance are at once thoroughly cleaned. Evidently, also, each patient while under treatment and observation should be for the time being separated from his mates, if he has any, and in quarters by himself.

In the foregoing much has been said which at least suggests the methods that must be employed in order to lessen the liability of dogs acquiring tapeworms, and there remains but little to be added.

The importance of having the kennels supplied with water as pure as possi-

ble can properly be again alluded to, since it is through the drinking-water that a very large proportion of cases of infection occurs. It is a fact, also, that many sources of supply contain the ova of worms.

Where one or only a very few dogs are kept it is quite a common custom for them to accompany their owners when marketing, and in butchers' shops they get many bits of meat trimmings. Not a few others are admitted to abattoirs, or are able to obtain more or less of the refuse from such.

It is safe to say that were all meats fed to dogs invariably well cooked, the number infested with tape-worms must be small indeed, comparatively.

Cleanliness in the dog and in his surroundings, as previously said, is one very important means of prevention. Nor ought it be necessary to urge that in all instances in which treatment for worms is applied, also where there is good reason for suspecting the presence of these noxious intruders, every discharge from the bowels should be burned, and the coat be disinfected often, by means of powdered sulphur, rubbed into it thoroughly and in very generous quantities.

The fact should be in sight always that worm medicines, also the purgatives which must generally follow them, are more or less weakening. Strong, healthy and robust dogs bear them well, but delicate subjects often require supportive treatment for a time; that is, a more generous diet, and likely a tonic.

SECTION XIII.
CONSTITUTIONAL DISEASES.

CHAPTER I.

DISTEMPER.

DISTEMPER is an acute infectious disease, characterized by catarrhal inflammation of the mucous membranes which line the mouth, throat, air-passages, stomach and intestinal canal; an eruptive fever of variable duration; great prostration; rapid waste; marked derangement and depression of the nervous system; with a strong tendency to recovery in the absence of complications, of which there is great liability.

That the disease is of microbic origin and caused by a specific poison or germ cannot be doubted, although the infecting agent has not been, with certainty, isolated and identified. In view, however, of the advances made by investigators and experimenters during the last decade there are grounds for the belief that its bacteriology will ere long be made clear.

Accepting this theory of causation, it must also be admitted that distemper never originates spontaneously, but is dependent always upon a continued propagation of the disease poison or germ, and transmission of the same from one to another. That is, that the disease is possible only when communicated by infection. Therefore, such influences as improper feeding, poor ventilation, exposure to cold and damp, which many have considered accountable for it, are not actual exciting causes, but merely predisposing or contributing causes. In other words, such influences alone are not capable of giving rise to this disease. They can only increase the susceptibility of dogs to it, lessen their power of resistance to the specific poison or germ, and possibly in some degree determine the severity of attacks.

Among the products of experience are the obvious facts that it is possible for the distemper poison or germ to reproduce itself, under favorable conditions, to an endless degree; that except in very dry air and place, it retains its great vitality and power of infection for a long time outside of the body from whence it came; also, that while still virulent it can be conveyed in the air, although the distance which it may be so transported is not great, and probably limited to a few feet only.

This disease is moreover highly contagious; and not only can it be transmitted direct, from dog to dog, but it may be conveyed by the living — human as well as canine — and by inanimate things, as feeding-dishes, water-buckets, blankets, collars, chains, sleeping-benches, bedding, crates, etc. Although the majority of its victims are less than one year old, no age is exempt; and it has even occurred after the tenth year, but such cases are rare exceptions. Nor is there aught in variety which favors resistance to infection, for one breed seems to succumb to it quite as readily as another, although greyhounds, bloodhounds, and St. Bernards are thought by some to be the easiest victims. It is a fact, however, that the more delicately nurtured and highly-bred, all that are denied ample exercise in pure air, and those whose surroundings are not healthy, usually suffer from the disease in its worst forms; with them, also, grave complications are most liable to set in.

Neither is any season of the year entirely exempt from this disease. It seems to have a preference for spring months, during which it is generally more virulent. The next season of danger is the fall; while during winter and summer but comparatively few cases occur.

The normal period of incubation is about seven days, but the first symptoms may manifest themselves in the course of four or five days after exposure to the disease poison or germ, and they may even be delayed until near the fourteenth day.

A few dogs are said to have had distemper twice, but such cases are open to suspicion of error in diagnosis. At all events, that one attack of the disease, successfully overcome, imparts an immunity from it for the remainder of life, is the rule from which there can be but few if any exceptions. It is true that occasionally dogs that have had it once exhibit catarrhal symptoms, as cough and discharge from the nose when they are again for a time in intimate contact with dogs suffering from the disease in severe form, but their affection cannot rightly be said to be true distemper.

A similar experience is not unusual in the practice of physicians, and frequently where a person is ill with diphtheria the nurse has more or less sympathetic throat trouble; but it is not of the peculiar character of the contagious disease present.

The initial symptoms of distemper may vary greatly, consequently the disease is liable to be on several days before its presence is detected. Generally for a short time the victim of an attack is somewhat dull or "dumpish," as commonly expressed, and disinclined to make very active effort. His appetite is capricious or entirely wanting; his nose is hot; his skin loses somewhat its smoothness and elasticity, and hair becomes dry and harsh. At times he is seen to shiver, especially when lying down; which he does always in a warm, rather than cool place.

In occasional cases, after existing for a day or two, these and any similar

symptoms that may be present, and which alone indicate merely that the dog is slightly indisposed, nearly or entirely disappear, and he seems again quite as well as usual; but if so the relief is deceiving and only temporary, and other signs of the disease are soon manifested. It is the rule, however, that once an attack is on and symptoms of it are exhibited, they slowly but steadily grow more pronounced.

Among the earliest of the most suspicious signs are sneezing, and rubbing or wiping the nose with the paws, a dry, husky cough, which suggests that something is lodged in the throat, and a watery discharge from the nose, also from the eyes, which are more or less reddened. But these symptoms are identical with those of an ordinary cold merely; hence it is easy to mistake their significance, and especially since the victim often seems otherwise quite well.

If the temperature be taken now it will generally be found to be at least one or two degrees above the normal.

This opportunity is favorable for a brief discussion of the value of the thermometer and manner of using it.

First, it may properly be urged that this important instrument should be at hand, for ready use, in all kennels of valuable dogs, for without it, in many instances of sickness, diagnoses with near certainty would be impossible. Again, in its absence judicious treatment would scarcely be possible in severe febrile diseases, since the choice of remedies depends so much on the temperature; and in many cases the higher the same the greater the danger to be apprehended.

The right form is the so-called clinical thermometer; used by physicians; and one that is self-registering is the most convenient. In it a small quantity of mercury is separated from the bulk of the same by a little air; and the instrument has this advantage, namely, that after the mercury has expanded as much as the heat present will make it expand, and the column has reached the highest point that it will go under the influence of that heat, the small quantity of mercury in question remains fixed at that point after the thermometer is withdrawn, while the bulk of it contracts and sinks back into the bulb. The instrument can then be examined leisurely and in a good light; whereas were it not self-registering he who was using it must get on to his knees, and, while yet it was in place, note the point reached by the top of the column of mercury.

Having recorded the temperature, the top of the thermometer — the bulb being down — should be firmly held by the thumb and first and second fingers of the right hand, and with the side of the palm of that hand the palm of the other hand should be struck several times with considerable force; by which means the small quantity of mercury will be shaken down in place; which should be below the ninety-eighth degree.

The best situations for taking the temperature are the mouth, groin and rectum; and preferably the latter, because, the air being excluded, the results are more accurate. And when in the rectum the length of time that the thermometer should be in place during each observation is about five minutes.

The fact should be emphasized that in health the temperature varies in these different places. It also varies somewhat in the breeds and sexes, at different ages, hours of the day, and under special influences; and such variations should be kept in mind, otherwise undue importance would likely be attached to them.

Taken in the rectum the normal temperature of mature dogs is about 101° , in the groin about 100° , while in the mouth it is about $98\frac{1}{2}^{\circ}$. In puppies the temperature runs a bit higher. As a rule in dogs in health there are fluctuations of between one and two degrees between sunrise and sunset; therefore in the absence of a rise or fall of at least one degree there can rarely be real occasion for uneasiness.

In other words, if taken in the rectum, only when the thermometer runs over 102° or falls below 100° , would suspicion of disease be justified from the temperature alone, unless it had kept up or down for a day or more; in which event some trouble somewhere within the system would be indicated.

In taking the temperature in the rectum the bulb of the instrument should be pushed in to a depth of about one and one-half inches at first, and about one-half an inch more about two minutes before it is withdrawn, that accuracy may be a certainty.

When the temperature is to be taken in the mouth, the muzzle of the dog should be grasped with the left hand, to keep his teeth together. Then the thermometer should be inserted between them and his cheek, until the most of it is well covered by the latter. In this situation, and in the groin, longer time is required for an observation than in the rectum, and it ought to remain in place nearly ten minutes.

The temperature in the bowel is not often below 100° in health; and generally, but not invariably, a fall to 97° would signify collapse, and that death was imminent. A rise to 103° would indicate the presence of moderate fever; while the fever must be very high when the thermometer recorded between 105° and 106° . In case of a still greater rise the outlook would be indeed grave.

Returning to the symptoms of distemper, if the temperature be taken after the signs of a common cold have appeared — sneezing, running at the nose, watery eyes, and cough — the thermometer will generally register 103° , or a little over, although the outward indications of the existing fever may be absent for a day or more; and the patient seem quite bright and lively, and indeed well but for his cold.

In occasional cases instead of the catarrh first attacking the head and air-passages it goes to the bowels. In consequence there is diarrhœa; and the discharges are watery and highly offensive. But aside from this the dog often seems fairly well excepting that he is a little "off his feed." His nose may still be moist and cool, and his temperature about the same as in health, or only one or two degrees above the normal.

Thus early an eruption may be found on the abdomen and inside the thighs. In a few instances it also appears about the mouth and eyes; while in extremely rare cases it extends over the body. It consists at first of red spots, scarcely larger than small beans, which are well scattered. But pimples speedily appear on them. These rapidly change to vesicles—or small blisters—filled with a watery fluid, which ere long thickens to pus. The pustules soon break, and the matter discharged dries and forms yellowish crusts; which fall off in the course of a week, very generally leaving round red spots, from which the color slowly fades; although now and then small ulcerations are seen in their places; but the same are evidently caused by the nails or teeth.

This eruption is highly significant, and where it appears with the symptoms described the chances are all in favor of the attack being distemper. And even in the absence of such symptoms its appearance should be held highly suspicious, and the subject be at once removed from his mates and isolated, for cases are on record in which this eruption was the first symptom of distemper exhibited.

So quickly does it dry up and disappear, usually in the course of two weeks only faint traces of it are left in the form of fading red spots, unless there happen to be the ulcerations mentioned.

Even if the catarrhal trouble be intestinal at first, as shown by the diarrhœa, it is not long in any case before the head and air-passages are similarly affected. Once inflamed, the eyes are soon quite reddened and watery. They cannot bear the light well, hence are not opened as widely as usual; and there is a tendency to close them often and keep them closed.

The watery discharge from the eyes and nose thickens, and at the inside angles or corners of the former a little matter accumulates. While the discharge, now slightly yellowish, dries around the edges of the lids, and perhaps glues them together while the animal is sleeping.

Shivering is very noticeable, especially while in the open air, which is entered reluctantly, and warm quarters are again sought as soon as possible. Vomiting is not uncommon, but the quantity raised is small, while the matter is thin and watery, and at times frothy.

The thermometer now runs up to 104° or higher; there is considerable thirst; only dainty morsels of food are accepted, but never with any avidity; the victim is dull and languid; he gets up reluctantly, and comes with drooping

head when called, but soon returns and lies down; and there is no mistaking that he is quite ill.

His sleep is dreamy and disturbed; his nose is hot and dry, and the discharge from it dries in thin crusts around the nostrils; the pulse is generally over 100°, the urine scanty and high colored, the tongue slightly coated, and the secretion of saliva diminished.

As the disease progresses the cough is more troublesome for a time, and may be accompanied by retching and vomiting; then it loosens as the mucous secretion becomes more abundant, and the huskiness disappears; so, also, the cough in mild cases. Except in short-headed dogs, in which it becomes what is termed "sniffing," the respiration is but little affected at first, nor as a rule at any time excepting in severe cases, in which it grows shorter and quicker.

The teeth soon have a thick brownish coating; while the gums are inflamed, sometimes even to the extent of ulceration; and the breath is exceedingly offensive.

When diarrhœa occurs early in an attack it generally soon stops, to be followed for a time by constipation; or the latter may exist from the beginning, and be quite obstinate. In most cases of considerable severity, however, diarrhœa usually comes on before the end of the second week, and then the discharges, as a rule, are at first black, and have much the appearance of liquid pitch; and if they are not soon controlled, but instead allowed to keep up, in time they are likely to consist largely of mucus, with more or less blood intermingled, and be accompanied by very painful straining.

The loss of strength and flesh is rapid in severe attacks of this disease, and in the course of a week or ten days from the beginning of them many victims are scarcely able to stand. All seriously diseased also emit a mawkish, fetid odor, that is quite offensive.

The catarrhal affection of the head is intensely severe in some cases, the discharge from the nose in time becoming very copious and tinged with blood, while the nose itself appears swollen. The eyes are also generally much inflamed; and in occasional instances ulceration of the cornea occurs.

In not a few cases the membrane lining the throat and top of the windpipe is greatly inflamed and more or less swollen. The mucous secretion, then of yellowish-greenish tinge and quite copious and ropy, is expelled during retching or attempts to vomit, which it seems to excite. With these patients there is difficulty in breathing, which is evident from puffing of the cheeks.

In uncomplicated distemper the temperature may rise at first to 105°, or a little higher, and in the course of one or two days, under right treatment, fall to 104°, or possibly to 103°, and soon be down to near 102°. Such falls would certainly indicate that the patient was doing well and the attack likely to be a mild one. If, however, the temperature kept up, manifestly the inference

must be that the patient was very ill; while if there was a sudden rise in temperature, it would be evidence of some serious complication, as capillary bronchitis or inflammation of the lungs or brain.

It follows, therefore, that the thermometer can scarcely be dispensed with in this and other serious febrile diseases, since it uncovers hidden and grave dangers suddenly occurring in their course, also plainly indicates the essential remedies; when treatment must otherwise often be erratic and perhaps altogether wrong. Consequently it should be used at least twice daily, and in severe cases at noon as well as in the morning and at night.

In very mild attacks the patients seem to be on the gain in the course of a week or ten days. In severe cases, however, not only is there no sign of improvement thus early, but the tendency is still downward; and if recovery eventually takes place, a change for the better is scarcely likely to be plainly evident before the third week has been entered; or it may have passed before the crisis has been reached.

Inflammation of the lungs is a very grave complication, which may occur at any point in the course, although the accident generally happens within ten days from the beginning of the attack.

It is manifested first by a chill and sudden, rapid and great rise in the temperature. Then follow the characteristic symptoms of pneumonia.

When the temperature, which has for several days been not over 104° , rises suddenly to 105° or to 106° , as a rule it indicates that some serious complication is occurring; and if the inflammation is not within the chest it will generally be found to have involved the brain.

Here it is well to state that if high fever has persisted for several days the indications are far more unfavorable than when there is a sudden and temporary rise to even a little higher degree. The danger is also great where the high fever cannot be materially reduced by means of aconite, quinine, antipyrin, or the like.

When the brain is affected during distemper, indications of acute meningitis may be exhibited, and perhaps violent convulsions occur, but generally this extension of the inflammation is not marked by any very pronounced symptoms, probably because of the great weakness and depression, and, as a rule, the evidence of it is mainly, increasing dullness in the patient and unconsciousness of what is going on about him, muscular twitchings, and likely a short but not violent spasm now and then; or there may be some loss of power in the hind legs and possibly complete paralysis of them.

Sight and hearing are greatly affected; and no matter how uncomfortable the position in which he is placed he is not likely to change it; thus showing how benumbed his brain.

With such symptoms the chances of recovery are small indeed. The patients weaken rapidly, and death usually occurs within two or three days.

While the usual complications are capillary bronchitis and inflammation of the lungs or brain, they may be serious affections of the liver, stomach, bowels or kidneys. Not a very infrequent complication is jaundice; and cases are on record in which distemper was ushered in with this trouble.

The pulse rises with the temperature, and during mild attacks of distemper the former runs about 100, or a little over at times. When complications occur it generally goes up to 120, and may be even 140 or 150. But when the brain is affected, and the trouble therein has existed several days, the pulse generally falls below 100.

Summarizing briefly, the earliest symptoms of distemper usually manifested are dullness and lassitude, coated tongue, hot nose, dry husky cough, sneezing, redness of the eyes, discharge from the same, also discharge from the nose—which is first watery, but later becomes muco-purulent and yellowish-white, or even bloody—shiverings, possibly vomiting and diarrhœa, thirst, loss of appetite, and fever.

These symptoms and a pustular eruption on the abdomen or between the thighs constitute very strong evidence of the presence of distemper.

The duration of the disease depends upon the severity of the attack and complications which arise. Where none occur and the attacks are very mild, the patients are generally on the mend in the course of a week. Severe cases without complications, as a rule, last for two or three weeks. While in those that run a fatal course, death commonly occurs during the second or third week; and it may result from paralysis of the brain, dropsy of the lungs, blood-poisoning, or general exhaustion.

The duration of complicated cases of distemper is problematical, and recovery is sure to be delayed, possibly for many weeks.

Capillary bronchitis is characterized by inflammation of the smallest bronchial tubes. It is a very grave affection, and one in which the chances of recovery are small indeed. To the non-professional the symptoms would seem to greatly resemble those of acute pneumonia.

Among the frequent sequelæ of distemper are chorea, skin eruptions, usually eczematous, loss of hair in large patches, impairment of the sight due to ulcerations of the cornea, chronic indigestion, and general debility.

In ulceration of the cornea there is much discharge, which runs down over the face and dries in yellowish crusts. The ulceration starts with a slight swelling near the centre of the eye; and the same subsequently breaks and leaves a small open sore.

This accident is of most frequent occurrence in dogs having very prominent eyes, and is sometimes attributable to their scratching and rubbing them.

In some cases the inflammation becomes very severe, and extends until the cornea is no longer transparent, but entirely clouded, and of a diffuse grayish-blue or grayish-white coloration, and presents a slightly uneven surface.

Distemper tends intrinsically to end after running a certain time, therefore it is self-limited. It naturally, also, tends to recovery, and fatal results due to the disease alone must be rare indeed; while complications or faulty management are, as a rule, accountable for them. In treatment these facts should be kept in sight, with another, no less important, namely, that reliable means of arresting this disease, or even of shortening its run, have not as yet been discovered. Consequently so called distemper-cures are delusions. Nor are active measures addressed to the disease itself justifiable except at first. By this is meant that the mere fact that the disease is present does not alone warrant the use of drugs beyond what might be called the preparatory treatment, for when the victim is carefully cared for it may run its course and recovery occur without further medication being required.

The medical treatment of distemper therefore should be expectant. In other words, the caretaker, after the initial treatment, should withhold drugs until he sees that they are absolutely needed. The patient should be carefully watched always, and as long as he is doing well under good nursing it should be relied on to pull him through; the fact being in mind that his situation can be likened to that of a person in danger of drowning not far from shore. If he drowns it is because his strength gives out before he can touch bottom. As a person in this situation only requires to be buoyed up for a short time, so the dog with distemper may need only supporting measures, as nourishment, stimulants, etc., to live until the disease has ended.

As has been aptly said of physicians, "Our endeavor is no longer, like that of mariners of old, to appease the fury of the storm-god by offerings and prayer; it is enough for us to keep our good craft seaworthy, and steer her safe 'mid rocks and quicksands; the storm will cease without our bidding when once its fury is spent."

Again it is urged that distemper patients be nursed with exceeding care, generously nourished, to obviate the danger of exhaustion, and closely watched always, that complications or other accidents may be immediately detected and properly combated by the right measures. And all the time if medicines are used let it be for definite purposes. Treat not the disease merely, but the disturbing symptoms as they arise. That is, if there be diarrhœa, check it with the appropriate medicines; if a degree of prostration dangerous to life is threatened, meet the emergency with stimulants; and so on.

Let the important fact sink deeply into the mind of the reader that infection having once occurred, no matter what may be its exact nature, whether distemper, septicæmia, or other form, and whatever the kind of infecting germ, in all cases one element of treatment is imperatively demanded, namely, that the strength of the animal be kept up by means of food and stimulants, to counteract the pronounced general depression that is invariable in cases of septic infection.

A dog attacked with distemper, or one presenting suspicious signs, should be at once taken from his mates and put into a room by himself, as far from them as possible.

That room should be of good size ; so situated, if possible, that it is accessible to the sun the greater portion of the day ; admit of good ventilation ; and can be artificially heated if the weather is cold.

Its temperature should be about 60° F., or only a trifle below that point, and the volume of heat be sufficient to permit of an opening for fresh air, but without draughts ; for the latter must be carefully avoided.

The bedding should be straw, and sawdust the covering of the floor. Both should be changed at least once daily ; and better twice if possible.

The sawdust should be removed without sweeping, for in catarrhal troubles the irritation must be greatly aggravated by fine dust.

There should always be a powerful disinfectant in the room, with the odor of which the air should be kept loaded as much as possible. A very good one is a powder composed of carbolic acid and lime. If the weather is not hot, and it is therefore possible to have a fire in the room, chlorine gas can be easily generated, and that, under right conditions, has a noxious effect upon disease-germs.

A large kettle nearly full of water should be kept on the stove, and in it, at frequent intervals, should be put a piece, of good size, of the best chloride of lime that can be obtained ; the water being renewed as often as necessary. Chlorine gas will be given off during the slaking of the lime, and the atmosphere of the sick-room being moistened by the steam from the boiling water, the gas must be very destructive to the germs of disease therein, provided it is of sufficient volume and it is constantly generated.

Another measure which has a favorable effect upon the atmosphere of the sick-quarters, and which might be resorted to in hot weather, is the burning of tar, in the following manner :

Into a milk-pan, or other large tin basin, pour tar to the depth of about one inch. Put into the fire a common brick, stone of about the same size, an old and discarded flatiron, or something of the sort, and heat, but not make red hot. This when dropped into the tar will generate a dense vapor or smoke, which is quite agreeable to the irritated air-passages, for it loosens the secretions, and thus renders the cough easier.

That the body may be of nearly uniform temperature, and thus danger of brain congestion and lung inflammation be lessened, a jacket made of several thicknesses of flannel or cotton wadding, to cover at least the chest, if not the entire body, should be sewed onto the dog ; care being taken to have it fit snugly at the neck and over the breast.

In cases of distemper in which the disease is detected early, it is well to clean out the bowels by means of calomel, provided of course there is no

diarrhœa. Nor would this treatment be wrong if the bowels were merely loose and only two or three discharges daily.

The dose of calomel for a pup over eight months old and of medium or large size breed is two grains; for pups about the size of fox terriers, one grain; for toys, one-half a grain.

Three doses should be given, intervals of two hours being allowed between each.

Two hours after the last dose, if the bowels have not moved freely, a dose of as pure olive-oil as can be obtained should be administered; and the same consist of two tablespoonfuls for medium or large size breeds; one tablespoonful for fox terriers, and the like; and two teaspoonfuls for toys.

These doses are scarcely more than laxative, and it may be necessary to repeat, in the course of two or three hours, if the bowels have not moved. But in view of the fact that in distemper there is more or less intestinal irritation, and even inflammation, which can be easily made worse, also that when diarrhœa occurs it is often intractable, manifestly the giving of strong purgatives or cathartics would be hazardous. No harm need be apprehended, however, from the use of olive-oil, which not only removes the poisonous and disturbing accumulations, but tends to keep the irritated intestines at rest.

The calomel and olive-oil will often reduce the fever; and if the temperature has dropped to about 103° , it will not require interference; but if it is up to 104° , and continues there, or runs higher, an effort must be made to lower it.

Aconite is the first remedy to be tried, and its combination with certain other agents, as follows, is recommended.

Tincture of aconite root, thirty drops; chlorate of potassium, one drachm; muriate of ammonium, one-half a drachm; sweet spirit of nitre, one ounce; water, two ounces.

Dose, one teaspoonful for breeds of medium or largest size; one-half a teaspoonful for fox terriers, and the like; fifteen drops for toys.

This mixture should be given every two hours until the temperature has fallen below 104° .

As a rule it has the desired effect of reducing the fever, but now and then fails, and if so, quinine must be tried, in the following doses:

For medium size breeds, four grains; largest breeds, five grains; fox terriers, and the like, three grains; toys, two grains. Three doses, made into pills or inclosed in gelatine capsules, should be obtained.

The temperature being over 104° , or having persisted for a time at or near that point, one dose of quinine should be given. If in three hours there has not been a decided fall in the temperature, another dose should be tried; and still another in three hours if the second dose has not had the desired effect.

Three large doses of quinine are all that one would be justified in giving.

The temperature persisting above 104° , and quinine having failed to lower it, antipyrin may be resorted to, in the following doses :

For largest breeds, twelve grains ; medium size, eight grains ; fox terriers, and the like, four grains ; toys, two grains.

When the case is severe, the fever very intense, and the thermometer goes above 105° , one dose of antipyrin should be given every hour until three doses have been administered, provided the temperature has not fallen after the first dose. But in cases of only moderate severity, the intervals between the doses may be two hours, and the number of doses be restricted to three, as in the first instance.

A case that resisted aconite, quinine and antipyrin must be obstinate indeed, and the only remaining means of reducing the temperature would be sponging with warm water and alcohol, in equal parts. But this should not be tried unless the fever runs very high and has kept up to 105° , or over, also every precaution against cold has been taken. The room should be heated to 65° . The jacket having been removed, the entire coat should be sponged every ten minutes until the temperature has fallen, then be dried by rubbing, and the jacket again put on.

Some writers on distemper advocate the use of fever mixtures constantly during the first days of the attacks, but such treatment cannot be justified, for not only are they not necessary except when the fever runs high, but the medicines that are generally recommended are quite sure to upset the already irritable stomach if they are taken for any considerable length of time.

The cough does not require medical treatment, nor would paregoric, syrup of squill, etc., so often prescribed for it, have any effect unless given in very large doses ; and then they must inevitably do more harm than good.

A liniment can be applied to the front of the neck with the purpose of lessening the cough and inflammation in the throat ; and it may be camphor liniment, a mixture of the oil of turpentine and sweet-oil, in equal parts, or one composed as follows :

Aconite liniment, two drachms ; belladonna liniment, two drachms ; camphor liniment, one and one-half ounces.

The preparation chosen should be gently but thoroughly rubbed onto the neck, morning and night.

Up to a certain period, when diarrhoea commonly occurs, constipation is the rule, and if it is not interfered with, the subsequent "looseness" is quite sure to prove very troublesome. Therefore, if possible by mild means, the bowels should be made to move every second day. Glycerin suppositories may be effectual, but if not, injections of olive-oil should be tried ; and the quantity be from one-half to one cupful.

As previously intimated, in distemper there is more or less danger attending the administration of medicines by the mouth for the purpose of moving

the bowels, and this method of treatment should not be resorted to unless absolutely necessary. It is safe to assume it to be necessary only after constipation has existed for about three days, and suppositories and injections have failed to overcome it.

One of the mildest laxatives should always be chosen, and even then the dose should be small, lest diarrhœa result.

Olive- or salad-oil meets the conditions admirably, and the dose should be as already advised after calomel has been taken.

An easy method of administration is floating the oil in an equal quantity of warm milk. Or the oil and milk may be well shaken together; in which event they must be given immediately, for they separate at once.

If the bowels have not moved in the course of four or five hours, a second dose should be given. After again waiting about the same length of time for the oil to act, if it has failed to do so it will be advisable to encourage a movement of the bowels by means of an injection of from one-half to one cupful of the same kind of oil, which will now very generally prove effectual.

When the bowels have been opened as advised, the danger of troublesome diarrhœa is greatly lessened. If an attack comes on, whether or not active measures to stop it should be at once employed will depend upon the character of the discharges. If they have the appearance of tar or pitch and are highly offensive, they are "better out than in," and diarrhœa medicine can be withheld for an hour, or perhaps two hours, that the bowel may empty, the discharges also become of lighter color, and their peculiar odor largely disappear. But while such matters should be expelled, for they are certainly poisonous, there is some danger in waiting for their expulsion, since the diarrhœa may get beyond control; and this is great when the discharges are very watery.

If the strength of the patient has been fairly well kept up, the following may be the diarrhœa medicine:

Tincture of opium, two drachms; subnitrate of bismuth, one-half an ounce; syrup of rhubarb, one ounce; chalk mixture, three ounces.

To be well shaken. Dose for largest breeds is one tablespoonful; three teaspoonfuls for breeds of medium size, two teaspoonfuls for fox terriers and the like; one teaspoonful for toys. It should be given every two hours in ordinary cases.

A lack of tone in the intestine is characteristic of distemper, and in some instances even powerful astringents fail to have the desired effect on the diarrhœa. Then the discharges continue frequent, notwithstanding the mixture just recommended is administered at short intervals; and in such cases it will be advisable to employ salicin at the same time, in the following doses:

To largest breeds, ten grains; medium size, eight grains; fox terriers and the like, five grains; toys, two grains.

This may be administered in wafers or gelatin capsules, and at intervals of about four hours.

Here the fact may be properly accentuated that in distemper the bowels should be neither constipated nor move too often, but if possible the happy medium should exist. That is, it is far better for the patient that one or two discharges occur daily than that they cease altogether; and this truth should ever be in mind and influence treatment.

Although vomiting may occur now and then during the first days, it is seldom sufficiently troublesome to call for special treatment. Indeed, if the attacks are only occasional they are salutary rather than prejudicial. If, however, they become too frequent it will be necessary to stop for a short time all other medicines and give the subnitrate of bismuth in from five to fifteen grain doses every hour, the smallest quantity being for toys and the other for the largest breeds.

Sometimes, but fortunately only rarely, vomiting is persistent, and the patients cannot keep either food, medicines or stimulants on their stomachs. In such cases if there is great weakness, a physician should be called and requested to inject from ten to thirty drops of brandy under the skin, several times daily.

As a rule after the fourth or fifth day, even if the patients seem to be doing well, it is advisable to commence tonic treatment, for the drain on the system and vital forces promises to be great.

A very serviceable tonic is the popular preparation, beef, iron and wine, provided always it is honestly made, of ingredients above suspicion. The dose is a tablespoonful for largest breeds; three teaspoonfuls for medium size; two teaspoonfuls for fox terriers and the like; one teaspoonful for toys. It should be given as often as every two or three hours. If specially prepared, and imported wine and the best of beef extracts are used, it will be far superior to the preparation usually kept on sale.

Stimulants ought not to be withheld until the point is reached when prostration plainly indicates that a failure of the vital powers and death are imminent. In other words, their use should be commenced before their need is positively urgent; but until then the doses of them should be comparatively small. Hence the beef, iron and wine is advised, because it is a stimulant as well as a tonic.

As long as a patient seems to be keeping up fairly well under the beef, iron and wine, no other stimulant need be given. But if he grows weaker notwithstanding its use, an equal quantity of good sherry wine should be added to each dose of the beef, iron and wine.

If failure is still progressive, and each day the patient is growing weaker, brandy must displace the sherry. It should not, however, be mixed with the beef, iron and wine, but be given separately, in milk, with or without raw

eggs, and the quantity be from a teaspoonful to a tablespoonful ; while the intervals between doses should be from three to five hours, as the need is urgent.

But even brandy may not prove sufficient to stay exhaustion, and then to each dose of it must be added the aromatic spirit of ammonia, as follows : One-half a teaspoonful for largest breeds ; twenty drops for medium size ; fifteen drops for fox terriers ; and ten drops for toys.

Brandy combined with the aromatic spirit of ammonia is the stimulant to be relied on in the so-called typhoidal stage, and when the brain seems to be affected.

Lest there be confusion and misunderstanding, the subject of stimulants is briefly considered.

Even if the patient seems doing well and his attack a fairly mild one, it will be advisable to commence the use of the tonic and stimulant preparation beef, iron and wine before the end of the first week. As long as he is holding his own that may be solely relied on, but if he is growing weaker, sherry wine should be added to it. When this combination fails to keep up his strength, brandy should be substituted ; and thereafter be persisted in, the doses being increased as necessary.

Some who have discussed in print the treatment of distemper have recommended that one of the various so-called bitters be given for the purpose of improving the appetite, but as long as the fever exists improvement in that direction is not likely to occur.

While the beef, iron and wine is being given no other tonic will be required ; but after the loss in strength has necessitated the use of brandy instead of sherry wine, a more powerful tonic can properly be substituted.

Quinine is an efficient substitute for the beef, iron and wine, and the doses may be as follows :

For the largest breeds, two grains ; medium size, one and one-half grains ; fox-terriers and the like, one grain ; toys, one-half a grain. The appropriate doses can be made up into pills by the druggists ; and one should be given every six hours.

An admirable tonic, better suited even than quinine to most cases of advanced distemper, is the elixir of calisaya, iron and strychnia. After brandy has been substituted for the sherry wine, instead of the beef, iron and wine, this may be given in the morning, at noon, and at night, in the following doses : To the largest breeds, one teaspoonful ; medium size, three-fourths of a teaspoonful ; fox-terriers and such, one-half a teaspoonful ; toys, fifteen drops. The use of this can be persisted in as long as a tonic is required ; and every three days, for three weeks, an increase of two drops at a dose may be made with toys ; five drops with fox-terriers ; eight drops with the medium size ; and ten drops with the largest breeds. It is best always that it be administered with the food, or shortly after feeding.

The discharge from the nose and eyes should never be allowed to accumulate, and several times each day all traces of it should be removed by the gentle use of a soft sponge and warm water, in each cupful of which has been dissolved a heaping teaspoonful of powdered borax. After that has been done the following solution should be dropped onto the eyeballs, also applied freely to the nose and adjacent parts:

Borax, forty grains; camphor water, four ounces.

If the nose seems swollen and the passage through it not quite free and open, it should be anointed with vaselin, in each ounce of which has been incorporated three grains of menthol. By means of a bit of cotton on the end of a wooden toothpick, a little of it may be carried a short distance within the nostrils. Care must be used lest it get into the eyes.

A measure of treatment which tends to lessen materially the catarrhal trouble in the head and discomfort occasioned thereby, is spraying the nostrils every two or three hours with a twenty-five per cent solution of listerin. This allays the irritation, favors easy discharge from the nose, also greatly lessens the amount of discharge, which under its use looses its thick, purulent and offensive character and becomes thin and watery.

Before spraying, the patient's eyes should be bandaged with a thick cloth to protect them from the medicine. His head should then be firmly held, with his nose elevated.

In the absence of a better sprayer, an atomizer designed for perfumes might do.

In addition to this local treatment it will be advisable during the first few days of an attack to syringe the nose with a solution of the peroxide of hydrogen.

A glass syringe capable of holding several tablespoonfuls will answer the purpose. A piece of very small rubber tubing, two or three inches in length should be drawn onto the end. An inch or more of this being inserted into the nostrils, the syringing will be quite effectual.

The hydrogen should be in solution as follows:

Peroxide of hydrogen, one ounce; bicarbonate of sodium, one-half a drachm; water, four ounces.

The head of the dog being firmly held by an assistant, and the rubber tip introduced into a nostril, the contents of the syringe should be thrown in with some force. Then at once the dog's head should be released, that he may eject the solution and free the passage. When he has done so effectually, and is fairly quiet again, the other nostril should be duly treated.

This application should be made twice daily until the nasal discharge has lost its purulent character and become thin and watery; after which there will not likely be any real necessity for its use, yet no harm can be done if it is repeated two or three times on as many successive days.

The use of the peroxide of hydrogen is urged because of its germicidal and antiseptic properties. There being good grounds for the assumption that the point of infection of distemper is in the nose, manifestly if that is promptly freed of germs, also of the poison generated by them, the attack must be less severe than it would be were they and their dangerous products left undisturbed; when undoubtedly they would multiply with great rapidity and increase in virulent potency.

In very severe cases, in the course of a week or ten days, the so-called typhoidal stage is usually entered. In this the brain is clouded as it were, and all the senses seem to be benumbed. When called in loud tone, or shaken, the effect upon the patient is generally a slight movement of the ears merely, and possibly of the legs or body, but he cannot be aroused; and, in a state of lethargy, he will likely lie for hours without any voluntary movement.

In this state his brain and nervous system are overwhelmed; and while recovery sometimes takes place, the chances are nearly all against it.

The disease is now often, and improperly, termed "head distemper." Convulsive movements or true convulsions may occur; and if so, and the attacks do not end quickly, the hydrate of chloral may be administered, as advised in convulsions.

In this stage and whenever the brain seems affected, the aromatic spirit of ammonia should be given with the brandy, for it is essentially a brain stimulant.

If the eyes are sponged frequently, and thus accumulation of the discharge is prevented, and the solution of borax and camphor water is dropped into them every hour, the cornea is not likely to become ulcerated. If, however, that accident happens, professional assistance must be obtained if possible. In its absence it were best to leave the case to nature to effect a cure.

The skin eruptions which often appear in the course of distemper scarcely require other than simple treatment, as the application of vaselin, ointment of sulphur and lard, or the like.

Jaundice with this disease does not call for any special treatment.

Suitable jackets are inexpensive and easily made, hence it is advisable that two be provided, and a change made every morning. The one not in use should be hung out-of-door during pleasant days, in the sun; and before the other is put on the hair should be rubbed gently with a soft towel, and then made straight and smooth with a brush.

During convalescence from distemper, cod-liver oil can properly be given in the majority of cases.

In that stage, vigilance must not be relaxed, because during the following two or three weeks there will be danger of relapse, which is always singularly liable to occur after distemper. Therefore every patient should continue to have the best of care; and especially be protected against sudden changes in

the weather, for a "cold" may prove even more serious than the original attack.

As already duly urged, good nursing is the all important requirement. The appetite being early impaired or wholly lost, to properly nourish during an attack of distemper will be no easy matter; and much ingenuity must be displayed in preparing a diet that will be palatable as well as nourishing. At first if the foods are wisely chosen they will likely be taken voluntarily in small quantities, but after a few days, certainly in very severe cases, the feeding must be forced.

Cold fresh milk, satisfying the thirst, is one of the most important and serviceable foods, and may be allowed freely throughout the attack; and with broken biscuits, stale bread crumbs, boiled rice, oatmeal or the like, as seems agreeable to the patient. Raw eggs may also be beaten up in it.

Fresh fish boiled to a jelly is good for a change, and as such may be tempting.

Gruels made of arrowroot or the various meals are also likely at times to prove acceptable.

When well, dogs are usually very fond of sheep's head broth, and it should be tried now and then, fortified with the meat that has been detached from the bones, and thickened with toasted bread.

Beef-tea is the most popular food for the sick, and as generally made it contains but little nourishment. That it may deserve to be called a food it should be prepared as follows:

Mince finely one pound of lean beef and put it into a preserve jar or other suitable vessel. Add one pint of cold water; stir well, and let the two set for an hour. After which cover lightly, stand the jar in a pan of water, and place in the oven, where its contents should boil gently until the meat is well cooked.

On removing the jar, pour its contents through a course strainer. Put the pieces of meat left on the same into a mortar and pound them into a paste. Return that paste to the tea, and stir it in well.

The meat in question is generally thrown away as worthless, whereas without it a tea has but little virtue; yet with such addition it is restorative, stimulating and quite highly nutritious.

Veal and mutton teas are prepared like beef-tea, those meats being substituted.

After a time, in most cases, only raw meat finely chopped is taken voluntarily; and that may always be allowed in reasonable quantities, the lean being chosen. It cannot be long however before this also is refused.

Minced, or, better still, scraped, raw lean beef may then be rolled into pill form, put into the back of the throat, and so forced down; or if the food is liquid it may be administered by means of spoon or from a bottle. All other

foods must be concentrated, and they may consist of strong beef-teas or broths, the juices or extracts of meat, and raw eggs in milk. The so-called extracts of beef on the market cannot be relied on, therefore meat must be obtained, slightly warmed, and its juice extracted by means of a lemon-squeezer or the like.

To prevent disordering the digestive organs, a danger which always exists where the feeding is forced, it will be advisable to have at hand a supply of the saccharated or sugar of pepsin, and put from one-fourth to one-third of a teaspoonful of it into every feeding.

In feeding the victims of distemper the rule should be "little and often." Even were food taken voluntarily and in sufficient quantities, four times in twenty-four hours would scarcely be any too often. If they require coaxing, and will eat but little at a time, they should be tempted at least every third hour; and when they must be forced to take nourishment, longer intervals of fasting than three hours in the day and four hours during the night would scarcely be safe.

For a dog of medium size one large cupful of nourishment at each feeding ought to be near right, provided the same be strong; but not if it consists of the clear juices of beef, of which three or four tablespoonfuls would be a goodly quantity.

A cupful of milk with two raw eggs beaten into it would constitute a generous feeding; and to the same, sherry wine or brandy can be added if required.

Milk and beef-tea or broths, to be fed by hand, may be thickened slightly with bread crumbs, rice, barley, or one of the various meals.

When raw beef, minced finely or scraped, is relied on, the quantity allowed at each feeding should be two or three heaping tablespoonfuls for patients of medium size or largest breeds.

In rare instances the stomach becomes so irritable that ordinary foods cannot be retained. Then for a time the whites of eggs mixed with a little water must be the main support.

Thus far the consideration of treatment in distemper has been confined to uncomplicated cases. Obviously those in which complications occur will require some modifications, which must be suggested by the nature of the accidental troubles or complications.

Pneumonia, or, as commonly called, inflammation of the lungs, — which is often accompanied by pleurisy, — is one of the most frequent complications in distemper.

Although its symptoms are quite distinct and pronounced, unfortunately it is liable to occur and exist for several days before its presence is detected, unless the patient is very carefully watched and the thermometer used habitually several times daily.

The lungs becoming affected, there is a chill, indicated by shiverings, followed by a sudden, rapid and great rise in temperature, the same usually reaching 106° . The attack is also characterized by weakness and prostration. And after it has well advanced there is difficulty in breathing, which often eventually becomes so great that the victim assumes a sitting position, which he keeps most of the time.

The respiration is then rapid and shallow; and in the majority of cases it is attended by a short, dry, husky, and seemingly painful cough. The appearance of the patient is otherwise changed; his eyes are more bloodshot; he moves with greater difficulty; his lips and tongue are purplish, and it is plainly evident that he is having a hard fight and suffering intensely.

Notwithstanding this complication and the increased danger, no radical change in treatment is indicated. Manifestly the nursing must be most faithful. It is evident also that unless the poor sufferer be properly supported by nourishment he will soon succumb. Therefore his attendant must remain constantly with him; and the rule to administer nourishment every three hours, by the clock, during the night as well as day, should be religiously observed. Milk and raw eggs, strong beef-teas and broths, and the juices of meats, are the forms of nourishment to be relied upon.

Stimulants must now be pushed, and consist of brandy and the aromatic spirit of ammonia. Nor is there much danger of pushing them too far. They should be given not less often than every third hour, and the quantity of brandy be one tablespoonful for medium size breeds; six teaspoonfuls for largest breeds; three teaspoonfuls for fox terriers and the like; and one teaspoonful for toys. To each dose should be added the aromatic spirit of ammonia, in quantities advised in the foregoing. All should be diluted with three or four times its quantity of milk.

A very peculiar effect of quinine is its ability to greatly modify an attack of pneumonia. It can scarcely shorten its course, but will materially lessen its intensity if given early and in one or two large doses.

As soon as the temperature has gone up to 105° or over, and there is otherwise reason for believing that the lungs are being inflamed, quinine should be given immediately, in the following doses:

For the largest breeds, ten grains; medium size, seven grains; for fox terriers and the like, four grains; toys, two grains.

Two doses should be obtained from the druggist; and each be put into gelatine capsules.

If in the course of three hours after administering one dose the temperature falls to near 103° , no more of the drug need be given; if however, such fall has not occurred, then the second dose should be administered—that is, within about three hours after the first dose.

Quinine is never likely to fail to reduce the temperature under such condi-

tions, but if it should do so, antipyrin must be resorted to, in doses already advised.

It appears to be the rule with writers to recommend the use of poultices in pneumonia. Properly applied, the hair having been shaved off, they would likely prove beneficial, but as usually made, and in the hands of the ordinary non-professional, they must be productive of more harm than good, inviting as they do the taking of cold while being changed, as they must be every few hours. It is best therefore that they be dispensed with, and reliance placed on the thick jacket of flannel or cotton wadding, which will keep the chest warm and the air from it, more than which a poultice could scarcely do.

It being necessary to change jackets once daily, it will be well when doing so to rub the chest with camphorated liniment or a liniment made of equal parts of the oil of turpentine and sweet-oil.

As for blisters and setons, so generally recommended, their use cannot rightly be encouraged.

If the victim of pneumonia occurring during an attack of distemper holds his own for three or four days, he will likely soon thereafter show signs of improvement, and eventually make a good recovery. Such happy results, however, are the exception, not the rule.

The appetite improving, the patient may be tempted with and allowed anything within reason that he will take. But until he will eat enough voluntarily, he must be forced to take nourishment.

The fact that nourishment can scarcely be safely forced into a patient oftener than once in three hours should be fully appreciated. When that method of feeding must be employed the digestive organs are weak, and to impose on them a duty at shorter intervals might result in upsetting them entirely. Hence to feed every half-hour or so, as has been sometimes advised, would be hazardous; and never oftener than two hours, and generally about every three hours, should be accepted as the only safe rule.

The cough of pneumonia does not require treatment. Indeed it would be advisable to encourage it, if possible, for it is a natural measure of relief.

If two patients down with distemper are quartered in the same room they should be separated as soon as one is attacked with inflammation of the lungs, for that trouble seems possessed of a tendency to spread.

Dogs are not, like mankind, able to materially assist expectoration, therefore in occasional cases of lung trouble they fill up until suffocation seems imminent. An emetic promises relief; and the wine of ipecac, having special virtues as an expectorant, may be used in the following doses:

For largest breeds, two tablespoonfuls; breeds of medium size, one and one-half tablespoonfuls; fox terriers, and the like, one tablespoonful; toys, two teaspoonfuls. If vomiting has not occurred at the end of ten minutes a second dose should be administered.

Or that admirable domestic emetic, common salt, may be administered as follows: For a dog of medium or large size put one tablespoonful into one-half a cupful of milk; pour it down his throat. Follow with nearly a cupful of warm — not hot — water.

En passant, it is interesting to note that this remedy, common salt, is with some the sole reliance in distemper, it being given in doses of from one-half to one teaspoonful several times daily; and with good results if the reports are to be believed.

In some cases distemper seems to fall on the nervous system with greatest force, and convulsions, paralysis or chorea result.

In cases of convulsions and paralysis, the great nerve centres, the brain and spinal cord, are commonly more or less affected, first by the impure blood sent to them, and later by certain degenerative changes. These complications, also chorea, generally occur late in attacks of distemper; and convulsions as well as chorea seem often to some extent assignable to errors in nursing during the convalescent stage, such as encouraging the patients to get about quicker than they ought, overeat, or take too hearty food. Convulsions may, however, come on early in an attack, and then usually in the so-called typhoidal stage, in which the brain is cloudy and congested. As a rule the fits are of short duration, scarcely beyond half a minute. They are also oftentimes of mild intensity, and limited to twitchings of some of the muscles of the head, and champing of the jaws.

Occurring when the brain is evidently seriously affected, convulsions are generally forerunners of fatal issue; but mild attacks of spasms late in the attack or during convalescence have not such grave significance, although once experienced they are very likely to be repeated, and the victim become a confirmed epileptic.

In cases of recurring convulsions, also, the spinal chord is often in time so seriously affected that paralysis of the hind legs results; when the case is desperate, and entire or even partial recovery quite infrequent.

When the spasms are of short duration they alone scarcely call for treatment, but if any is necessary, chloral hydrate should be used as advised in convulsions. To prevent as much as possible their recurrence the patient should be kept very quiet, and nourished generously with liquid foods, consisting largely of milk, cream and eggs. Of the drugs which might have a salutary effect the bromide of potassium promises the best, although it is not likely to be of material benefit. It can properly be tried, however, in doses as follows:

For largest breeds, twenty grains; medium size, fifteen grains; fox terriers and the like, ten grains; toys, five grains.

This medicine might be given three times daily for ten days, but not longer. Each dose should be dissolved in not less than a tablespoonful of water; and

while it is being given the bowels should be kept open and free by salad-oil, magnesia, syrup of buckthorn, or other simple means.

The paralysis that occurs in distemper is usually in the hind legs, but sometimes the fore legs are affected; while in very rare instances the loss of power is quite general.

The paralysis is commonly due to affection of the spinal cord, and while the outlook is serious even in seemingly mild cases, as a rule the greater the loss of power the less encouraging the prospect.

The symptoms of paralysis are generally delayed until recovery from the attack of distemper is near complete; in most cases also they develop gradually. The first notable sign is unsteadiness in the gait, and perhaps the dragging of one leg, the toes being swept on the ground. There is difficulty in getting up, which increases steadily, until finally it is no longer possible, both hind legs being too powerless even to support his body when the victim is placed on his feet and steadied by the hands.

The gravest symptom in cases of paralysis is retention of the urine, for it must be drawn by means of a catheter, and the chances of a cure are too small even were it possible to apply the troublesome and exacting treatment demanded.

Paralysis following distemper requires much the same treatment as the affection when due to other causes, and that has been duly described elsewhere.

If recovery is likely to occur, some improvement should be noted in the course of two or three weeks. Thereafter the gain would be generally very slow, and cure rarely complete before the end of the third month; and it might be longer delayed.

Chorea, which is far oftener due to distemper than to other causes, has been fully described in a section devoted to the subject.

Occurring in distemper it is due to trouble in the spinal cord, and commences gradually, the first evidence of it being generally a twitching of the muscles of the cheek or jaw. From there it extends to other parts. In time it may disappear from the part first affected, and remain only in a leg or some muscles of the head or neck. Or several muscles in various parts may be permanently involved, and in consequence the poor dog be a pitiable object, scarcely able to stand or get about.

Before closing this discussion brief reference may properly be made to the popular and prevalent fallacy that all dogs must have distemper, also to the kindred notion that it is necessary for them to experience an attack before they are a year old.

Distemper, like measles and scarlet fever, finds the great majority of its victims among the young, yet is by no means confined to them, for many cases are on record in which the attacks occurred even after old age had been

entered. While some dogs have lived a goodly number of years and died without having the disease.

The young are probably more susceptible to it than the matured, but there is no disputing the fact that an experience with it at any period of life is not absolutely necessary; nor possible while its specific germs are successfully evaded.

In other words, as long as one's dog does not come in contact with, or approach within a few feet of, a sufferer from distemper or any animate or inanimate thing that bears its germs, he cannot have that disease.

While by unremitting vigilance and constant care there are many chances of a dog escaping distemper, even the greatest caution and application of the most faithful protective measures cannot insure immunity from it, for he may be constantly perfectly isolated and never allowed to leave his kennels, yet sooner or later encounter a person who has recently been in contact with a victim of the disease, acquired some of the germs, which clung to his clothing, and thus become an innocent conveyer or means of transmission.

The owners of valuable dogs, therefore, should exercise a reasonable amount of care against infection; but to go further and institute and practise rigid precautionary methods would not be justifiable, since the chances of failure are so many.

During late years interesting experiments have been conducted with the purpose of preventing the disease by means of inoculations with attenuated distemper virus. Thus far the results have been somewhat disappointing, and up to the present time no means of prevention has been discovered that has stood the crucial test.

But in view of the lasting immunity conferred on dogs by an attack of the disease, it seems highly probable that a method of producing artificial immunity will eventually be perfected.

As for the nostrums that have been advertised as sure protectors against distemper, one and all are positively worthless.

To destroy the germs of disease and render kennels safe after cases of infectious maladies have occurred therein, the main reliance in times past has been sulphur fumes. That this means is usually effectual when rightly applied cannot be denied, but, unfortunately, in the hands of the inexperienced it often fails to accomplish its purpose; and other and more certain methods of disinfection have long been sought. Recently a new invention for disinfection has been adopted by some Boards of Health, which seems not only to do its work without causing the inconveniences of sulphur, but also much quicker and better. The active agent is formaldehyde gas; which is manufactured in a very simple stove or lamp.

The basis of this gas is wood alcohol. The present stove is of simple con-

struction and easily used. Whereas sulphur acts badly on many articles, this gas injures nothing ; moreover, it penetrates where sulphur fumes cannot reach and have considerable effect. Being inexpensive, breeders are advised to provide themselves with some such contrivance ; which may be occasionally employed to advantage, even if the kennels escape infectious diseases.

The alcohol is but slowly converted, therefore the gas would escape through crevices and openings if any existed. Consequently it would be advisable always to employ a large generator. and seal the room to be disinfected as tightly as possible.

CHAPTER II.

DIPHTHERIA.

DIPHTHERIA is an acute infectious disease, caused by a specific micro-organism or germ, and characterized by the formation of a false-membrane, which usually appears on the lining of the nose, throat or passage to the lungs or bronchial tubes, also occasionally upon wounded surfaces. The development of this membrane is accompanied by congestion and swelling of the underlying and adjacent tissues, and more or less fever, prostration, and other disturbances of the general system.

While the real exciting cause is doubtless the diphtheria bacillus or *ptomaines* produced by it, there are doubtless other influences intimately concerned in the causation, and which create what is termed susceptibility to the disease. But of these practically nothing is as yet known. It has been the general impression that it was much more liable to occur among the badly nourished and those exposed to faulty drainage and emanations from filth. But it is exceedingly doubtful if such conditions have any considerable influence upon it. It appears, however, reasonable to assume that the dogs too closely confined to kennels, even if the sanitary condition of the same be good, and not allowed sufficient exercise in fresh air and sunshine, are the easiest victims of the malady. Deprived of these the general health is more or less impaired; even slight exposure in bad weather may excite an irritation or low form of inflammation in the nasal passages and throat, and the lining membrane of these parts is then in a condition most favorable for the lodgment and propagation of the diphtheria germ. In other words, the soil is then right for the seed. And in truth there is every reason for the belief that a healthy mucous membrane is eminently capable of successfully resisting this malignant germ.

The false membrane first appears as thin white patches, but later, especially in very severe cases, it thickens and has a dirty grayish or yellowish tinge.

The constitutional affection is a blood-poisoning, which occurs through absorption of the poison at the points at which the disease first fixes itself.

While dogs but rarely fall victims to diphtheria, the fact has been proved that they and various other domestic quadrupeds are not exempt from it. Moreover, it would seem that between this disease in such animals and human diphtheria there is a close resemblance. Indeed, a case of contagion between a calf and man has been observed; while by the means of inoculation — the

virus having been obtained from man—this disease has been produced in dogs. More than all this, there is at least one well authenticated case on record in which diphtheria was transmitted from a man to a dog.

The same preferences for certain localities is exhibited by diphtheria of dogs as that of mankind; and as a rule the false membrane first appears in some part of the throat, from which it very generally extends, and possibly involves the nostrils and, more than likely, the larynx. But in a small proportion of cases the nasal passages are first invaded, and extension goes on from there; although in these the rule is that the disease throughout its course remains largely confined to the points of attack.

While the danger from diphtheria is measured somewhat by its location, and the greatest exists where the windpipe is involved—for then speedy suffocation is almost inevitable—it cannot be estimated on this line alone, for there is blood-poisoning to be considered; and that, indeed, seems the easiest where the disease is intrenched in the nasal cavities.

The initial symptoms of diphtheria vary in different cases. Occasionally it commences with shivering, followed by quite high fever, thirst, loss of strength and marked restlessness; but this is exceptional, and the rule is that the disease sets in gradually and insidiously, and for twenty-four hours, at least, the victim is, to appearances, merely what the ordinary observer would term dumpish.

With pets the first pronounced symptom which generally manifests itself is a very offensive breath; yet this is almost always construed as an evidence of "biliousness." About the same time the glands in the neck begin to swell; but while in some instances the enlargement is soon sufficient to create an obvious deformity, especially in dogs of light build, usually it is not considerable at first, and increases slowly and becomes very great only when blood-poisoning has occurred. The eyes are also watery and wear a dull, languid look; there is loss of appetite; and although the patient may come when called, his reluctance is plainly evident; nor is he easily aroused from his sluggish and drowsy state.

Likely these are all the notable symptoms for the first two, or possibly three, days, when others are added which point plainly to the nasal cavities or throat. If the disease is limited to the former, its detection with absolute certainty is scarcely possible. However, it may be strongly suspected if the victim, presenting the foregoing symptoms, can only breathe through his mouth, and there is a copious discharge from the nose, which, at first watery, soon becomes foul-smelling, of a brownish color and mixed with blood. And if the parts before the eyes are puffed up, the chances that diphtheria is the cause of these various changes is greatly increased.

When the disease is located in the throat, after the first three days the victim's mouth is almost constantly open, and there is an abundant discharge

of saliva. Swallowing is manifestly difficult, if not impossible. While if the windpipe is involved the respiration clearly betrays the fact, it being quick, labored and hissing or croupy. As for the voice, that is almost always entirely lost, but if heard it is only faintly, and very hoarse.

Aside from these symptoms there is one which points quite plainly to diphtheria, namely, an extension of the head, with the neck stretched and so stiff that in forced movements of it—as when medicines are being given—the evidences that severe pain is excited are too pronounced to be mistaken.

To examine the throat of a dog suffering with diphtheria is far from easy, owing to this neck trouble and stiffness of the jaws, caused by the glandular enlargement; and even when it can be made, the results are by no means always conclusive, for the disease may be out of sight. However, in such cases the throat is generally found much inflamed, of a dark red color, and swollen; while if the false membrane can be made out it appears like dirty-white kid. It may seem to cover much of the throat, or there may be patches of it here and there, the smallest being not much below the size of a nickel.

Although there may be some, and possibly high fever, it usually subsides during the early part of the attack. As for the pulse, that is generally rapid, full and hard at first, and then slowly grows feeble; but sometimes it is very rapid at the outset, and speedily drops even lower than in health.

Where the windpipe is affected, death is almost always caused by suffocation; and as a rule it comes about the third day after the symptoms of throat trouble are too pronounced to be mistaken. Death by blood-poisoning, however, is usually slower, and generally delayed for a week or longer, although in very malignant cases it may occur in the course of a few hours after the disease has been firmly established.

Diphtheria is one of the most fatal maladies, and death may confidently be expected where the windpipe is involved. Scarcely less fatal are those cases in which the disease is located in the nasal cavities; and in them the end is reached by blood-poisoning. Confined to the throat, and not extending up into the nose nor downward into the windpipe, the chances of recovery are better; and they would be good could the membranous patches be reached with appropriate remedies. But still, all things considered, they are very small even in this class of cases. Therefore it may be accepted that once diphtheria attacks a dog, death is well-nigh, speedily, inevitable.

Considering that it is contagious and can be induced by contact with the victims, also with infected objects, moreover, that there is a possibility that it might be transmitted from dogs to man, obviously a victim of it is dangerous to his mates, and perhaps to his people. Weighing again the fact that the chances are nearly all against recovery, also that if it occurs blindness or paralysis is likely to follow, it will be easy to accept that when the disease is made out the only wise and safe course is to destroy the sufferer.

This done, the quarters occupied by him should be thoroughly cleaned, lavishly treated to a solution of corrosive sublimate—1 to 5,000—and finally to a faithful whitewashing. The meanwhile, and from the first appearance of suspicious signs, his mates, if he has any, should be removed from the kennels, quartered out-of-doors if the weather will permit, or in a heated building if it is not mild enough, and only be returned after their quarters have been rendered safe by disinfection, the drains have been carefully looked to, and all else about them made right.

It is scarcely necessary to urge that in cases of diphtheria in the human family all pets should be religiously excluded from the sick rooms; not alone because they may acquire the malady directly from the patients, but because they are acknowledged mediums for its transmission. Indeed cases are on record where, beyond doubt, cats from infected homes have, by contact, conveyed the special cause or germ to other cats, and they in turn introduced them into the families to which they belonged. Nor is this mode of conveyance a sure one for diphtheria alone; there is abundant reason for the belief that it is as certain in many other, if not all, highly infectious diseases; and physicians of to-day fully recognize the fact that domestic animals, if admitted to the sick, are a menace to the well with whom they may soon afterward come in intimate contact.

Although it has been urged that victims of diphtheria be destroyed, the chances are that now and then efforts will be made to cure, hence the means that promise best ought to be herein considered.

Treatment must be promptly applied, otherwise it can be of no avail.

The victim should be at once put into a room that will admit of good ventilation, and can be warmed if artificial heat is required.

The bedding should be of straw, and the floor covered with saw-dust; both of which should be changed daily.

The air of the room should be kept constantly loaded or impregnated with a disinfectant, as advised in distemper.

The local treatment is of first importance, and if the nose is the seat of the trouble it should be treated to injections of the peroxide of hydrogen, the solution of which should be as follows:

Peroxide of hydrogen, three ounces; bicarbonate of sodium, one drachm; water, one ounce.

The syringe should have a small rubber tube attached, as recommended in distemper, and the injection be repeated every four hours or five hours.

If the disease appears to be in the throat, that should be as often freely swabbed with this solution, by means of a small sponge tied to the end of a stick.

When the air passages seem involved, by the means of an atomizer the throat should be well sprayed with the same solution every three hours.

For internal treatment preference is given to calomel in minute doses.

Granules of various strengths can be obtained, ready prepared by druggists.

Those containing one one-hundredth of a grain would be right for toys or dogs of the size of fox terriers; while one-fiftieth of a grain would be suitable for medium and large size breeds.

One granule should be dropped on to the back part of the tongue, and the patient forced to swallow, every fifteen minutes during the day, and nearly as often, if possible, during the night.

If the throat is much inflamed, or the breathing indicates that the air passages have been involved, a small bellows should be obtained, of the form designed for insect powder; and in this the following should be used.

Calomel, one-half a drachm; sugar of milk, three and one-half drachms.

Every four or five hours, about one-fourth of a teaspoonful of this should be put into the bellows. Then, the head of the patient being fixed and the jaws opened widely, the tube of the instrument should be inserted and the powder thrown into the throat as deeply as possible.

One granule should be administered and the insufflation practised as advised until there are black discharges from the bowels; when they should be discontinued.

The same patient may have the peroxide of hydrogen used in his throat as well as insufflations of calomel, but between the different applications there should be an interval of about two and one-half hours.

If there is great prostration and the patient is steadily growing weaker, heart failure is threatened, and a stimulant tonic must be given. Strychnia recommends itself, and should be in form of granules as follows:

For largest breeds, one-fiftieth; medium size, one-sixtieth; fox terriers and the like, one one-hundredth; toys one two-hundredth of a grain.

One granule should be administered every six hours.

If weakness be progressive, brandy should be added to the treatment, and given every fourth hour, in doses from one-half a teaspoonful to a tablespoonful.

Strong beef-tea, raw eggs and milk, scraped lean raw beef, or beef juice, should be forced into the patient, every three or four hours.

That the disease is to some extent a menace to numbers of the human family who are in contact should be accentuated. Only those whose assistance is actually required should be admitted to the patient; and they can easily obviate any danger. His breath is contaminating, and were he to cough in the face of the caretaker the results might prove serious, in consequence of the poison being thrown into the eyes or onto the lips.

The writer has attended many hundreds of cases of diphtheria in children without suffering any injury, and the only precautions taken were to immediately bathe his face and eyes in pure water when the patients had coughed on those parts; and always while in the presence of a diphtheritic patient he kept

an unlighted cigar between his tightly closed lips. On leaving he washed his hands in a solution of carbolic acid.

The blood and serum, or watery constituent of the blood, of animals immunized against certain diseases contain substances called antitoxins, which, when injected into healthy animals, will give them immunity to the same diseases. Further, not only will the serum confer immunity to later infection, but will, if not given too late, prevent the otherwise fatal outcome of the disease in animals already suffering from it.

So called antitoxin against diphtheria, obtained almost entirely from horses, has been quite extensively used by physicians during recent years in the treatment of the human form of the disease, with quite uniformly good results; and, it being evidently analogous to the disease in dogs, the same treatment should promise quite as well with them. But they being so rarely victims of it, the use of the antitoxin would manifestly be limited to cases in which attacks have already, but only recently, occurred.

ERYSIPELAS.

Erysipelas is an inflammation of the skin usually attended by fever and quite severe disturbance of the system. Usually, also, but not always, it begins at a part previously inflamed, or which has been wounded in some way; and its natural tendency is to extend and involve large surfaces.

The part affected by erysipelas is somewhat swollen, and in consequence the skin is tense, smooth and glistening. It is also hot, throbbing, and painful on pressure. The color varies from a pale red to a bright red hue, and the limit of redness is sharply and well defined.

Generally, but not invariably, the affection continues to spread for from three to five days, then remains stationary for a short time; after which it slowly subsides, and, although it may persist for several weeks, as a rule it has run its course in about ten days from the occurrence of the first symptoms.

As it subsides the redness of the skin slowly fades, the swelling decreases somewhat, but still there may remain some thickening for a time, during which if the affected part is pressed firmly for a moment with the end of the finger it retains the impression, the pit disappearing but slowly. The skin is now covered with abundant scales or crusts, or the inflammation may have gone deeply enough to involve the tissues beneath the skin and cause abscesses or boils, or even sloughing and extensive destruction of the skin.

After the disease has subsided the hairs fall out, but they soon grow again unless the skin has been permanently affected.

While the local trouble has been going on there has usually been much

disturbance within, the same as a rule beginning with a chill, as shown by shivering, and occurring a little before the eruption appeared. Then follow fever and its associate manifestations, as rapid pulse, thirst, restlessness, etc.; and in very severe cases there is delirium, also great prostration of all the vital forces, as in typhoid fever.

Erysipelas in the dog must always be considered a very grave disease; and recovery can rightly be expected only in a small proportion of cases.

It is contagious as well as infectious, and can be conveyed from one to another. Therefore all victims of it should be isolated. Furthermore, caretakers should keep in mind the fact that they are in danger of "taking" it from their patients; hence should be in actual contact no oftener than absolutely necessary. They should also use freely on their hands a disinfecting solution of corrosive sublimate, of the strength, 1 part in 5000 parts of water.

One of the best local applications is the following:

Dilute acetic acid, two drachms; solution of the subacetate of lead, two ounces; tincture of opium, three ounces; water, sufficient to make this mixture one pint.

The affected parts should be kept well moistened with this.

An excellent application, the use of which necessitates only occasional attendance, may be made by dissolving twenty grains of aristol in one ounce of collodion. This should be applied freely to the inflamed area, and a little beyond it, with a large camel's-hair brush; and be renewed as often as it scales off.

Internal treatment is always essential. If the patient be unusually full blooded he should be given a cooling medicine, as magnesia or Epsom salts. If of medium or largest size and in fair health when attacked, fifteen drops of the tincture of the chloride of iron, well diluted with water, should be given him every three or four hours; while ten drops for fox terriers and the like, and six drops for toys, would be right.

If he shows signs of failing rapidly, brandy is indicated.

From the first the diet should be generous and highly nutritious, and consist of beef-tea, milk, raw eggs and scraped raw beef.

After the third day, quinine in two grain doses, four times daily, should be added to the treatment.

When the disease has subsided the oxide of zinc ointment may be substituted for the lead wash.

In event abscesses or sloughing occur, appropriate treatment must be, of course, applied.

In some cases vomiting is persistent during the early stage, and in such, the tonics must be stopped for a time and the subnitrate of bismuth substituted, the dose being ten grains every two hours. The diet should also be reduced to milk and lime water or the whites of eggs.

SMALL-POX.

There are on record a few cases of an acute eruptive fever to which the name "Puppy Small-Pox" has been given. Unfortunately the reports of these are so barren of important facts, for the present any discussion of the affection must necessarily be very unsatisfactory, and much left to conjecture. Nor is it possible even to judge understandingly of the real merits of its claims to the name bestowed on it. But the hope is entertained that this allusion, bare as it is, will favor careful observation in the future, until the disease is defined and perfectly understood.

In one instance it attacked a litter of puppies that had just passed their eighth week. Some members of it had recently left the kennels and been sent to distant places. All of these, as well as the puppies remaining, were taken down suddenly and died within forty-eight hours.

Shortly afterward another litter in the same kennels was similarly affected, and all the pups died in the course of three days. Once more these kennels suffered. This time the victims were only two days old. All were at once taken by the mother from the whelping quarters, that had been specially prepared for her, and carried to a shallow place under an out-building; where she dug a hole for them, and they remained under her sole care, it being impossible to reach them. Strangely in this case all made a good recovery. When five or six weeks old they were caught and found to be covered with bare spots; but the eruption had healed.

In the first instance the chances of contagion appear to have been few indeed. In fact all other inmates of the kennels were for a long time previous in good health, no strangers had been among them, nor had similar attacks ever been known to the owners of dogs for miles around. As for the second and third experiences, of course they were likely due to the first.

These and other like attacks reported elsewhere were very sudden and exceedingly violent. The eruption was at first papular, and limited to a few spots here and there, but it rapidly spread over the body and legs. The papules changed to vesicles in the course of two days, and then in a day or two became pustules. Where recovery occurred, however, there was no pitting.

From the appearance of the eruption until it had been healed entirely the interval was about four weeks.

Within the knowledge of the author only one writer of note has discussed this disease in public print; and although his contribution is highly interesting it is characterized by an uncertainty that seems to indicate that his experience also had been very limited. While the assumption naturally follows that some of his conclusions were speculative.

He says "This is a rare malady, and may be developed directly or by con-

tagion; it is supposed to be also produced by the variola of man and of the sheep. It chiefly affects young dogs, although old animals are not exempt. One attack ensures immunity for the remainder of the dog's life.

"The disease commences with fever, which continues for two or three days, and is followed by the appearance—over a large surface of the body, though rarely on the back and sides of the trunk—of red points, resembling flea-bites, which are quickly transformed into nodules, and then into vesicles. The contents of these become purulent and finally dry into a crust, whose shedding leaves a naked cicatrix.

"In the dog, as in the sheep and pig, there are different forms of the disease, and it is benignant or malignant accordingly. Puppies nearly always succumb, and, on a necroscopical examination, it is not unusual to find various pustules on the mucous membrane of the respiratory and digestive organs.

"The disease being contagious, though the virus does not appear to be very volatile, it is necessary to isolate the sick, and to take due precautions that the contagion is not carried from them to healthy animals.

"Careful dieting, a dry and moderately warm dwelling, cleanliness and abundance of fresh air are the essentials in the curative treatment.

"An emetic in the early stage of the malady has been recommended as likely to be useful. Afterward the treatment must be purely symptomatic."

That this disease is infectious is highly probable; and that it is characterized by an initial fever of short duration and succeeded by an eruption passing through the stages of papule, vesicle and pustule, is evident from the reports. There is very decided resemblance therefore between such attacks and those of small-pox in man. It remains to be proved, however, whether or not they are nearly related.

A reasonable deduction from the few cases on record is, that treatment is not at all likely to be followed by good results, and were a young litter attacked, about all that could be done would be to isolate the pups and mother, nourish her carefully, and trust the little ones entirely to her and to nature.

ACTINOMYCOSIS.

Actinomycosis is an infectious disease of cattle. It is also of occasional occurrence in man; and less frequently dogs are victims of it. Indeed in the long experience of the author he has encountered but one case.

It is caused by a ray-fungus—actinomyces—which grows in the tissues, and develops a mass made up of individual growths, of the size of millet-seed. These aggregate, and the collection may be as large as one's fist. They are generally yellowish, and of about the same density as tallow. The

connective tissues adjacent to them become dense and hardened; abscesses also form, and the pus therein contains yellow granules.

Evidently infection generally takes place through the mouth, teeth or throat; and much less often it appears to occur through the air-passages or the skin. The vehicle for the specific poison may be the food or drink; and one scientist, after studying a large number of cases, has reached the conclusion that in cattle the poison enters the system by means of the infected grains of some cereal. Infection through the mucous membrane or skin is not possible while the same is normal, and only when it is broken or wounded. As a rule there is first some difficulty in opening the jaw, and likely in swallowing; while now and then the patient seems to suffer as he would from an aching tooth.

A swelling appears at the angle of the jaw. This is soon converted into an abscess; which usually first opens externally, and after a time another opening occurs, but that is into the mouth. In the pus discharged there are the little yellow granules previously mentioned.

Unless proper treatment be promptly applied, the inflammatory process extends downward — while the pus burrows in the same direction — and the structures of the neck become diseased. If still neglected, the chest, and even the abdomen, also the organs within them, are quite sure to be similarly affected.

While it generally starts at the angle of the lower jaw, it may first appear on the upper jaw; in which event it is liable to extend upward and involve the coverings of the brain or the brain itself, together with the upper bones of the spine.

A diagnosis is not possible without the aid of a microscope, although the disease has some peculiarities that are suggestive, as the thickening or wooden-like hardness of the tissues adjacent to the parts diseased, and the yellow granules in the pus.

The course of the affection is slow and tedious.

The essentials in the way of treatment are, prompt opening of the abscesses, the incisions being of generous length, and a free use of an agent that is destructive to fungus-growths. Some professionals, after opening, cauterize the walls of the cavities made by the abscesses, with the nitrate of silver. With the permanganate of potassium, however, the best results have been attained. Under its use the swelling has rapidly subsided and the disease disappeared. As for internal treatment, the iodide of potassium in very large doses recommends itself.

If the primary abscess has been opened with the knife the chances are that a cure will be speedily effected provided the dog is fairly strong and healthy; but if it has been allowed to open spontaneously, recovery is not likely to be complete for several months.

DROPSY.

Dropsy is an abnormal serous effusion into the cellular tissue or any cavity of the body. It has various modifications in name according to its situation. For example, dropsy within the head is termed hydrocephalus; when in the chest, hydrothorax; and in the abdominal cavity, ascites.

The fluid collection which constitutes dropsy, when first drawn is sometimes like water — thin, clear and colorless — but generally it is reddish-yellow, or amber-colored, and slightly adhesive or sticky. It is also occasionally filled with flakes, as in chronic peritonitis. On exposure to the air it thickens and becomes jelly-like. It varies in quantity from a small amount to sufficient to distend the walls of the cavity until it causes deformity, that in some situations resembles a large, firm and hard tumor.

Dropsies are not attended by inflammation; and ascites, the form most common in dogs, is never an independent disease. It is a symptom merely, and may indicate disease of the heart, kidneys, liver or lungs, impoverishment of the blood, or obstruction in circulation which causes stagnation of that vital fluid. It may also be the result of disease within the abdominal cavity, or of the peritoneum, which is the serous membrane that lines the same.

The evidence of ascites is the presence of fluid in that cavity. When of small amount it is not noticeable, but a large quantity gives the abdomen unusual prominence, and even the appearance of advanced state of pregnancy.

The accumulation of liquid takes place without pain or tenderness. Generally also it forms rapidly; indeed there may not be any sign of anything unusual at night, and yet the following morning the abdomen be very much distended, and the weight of the dog greatly increased. The appearance is then quite characteristic, the abdomen having fallen or sagged, and drawn downward and away from the flanks; which have now lost any roundness they may have had, and look thin and shrunken; while the backbone sticks up, and the hips are prominent through the skin.

If the subject be a female she has the appearance of being with pup, yet there is no enlargement of the breasts, nor can the womb be outlined. Moreover, the distention is quite uniform, whereas in pregnancy the enlargement is mainly in the central and posterior parts, and not until shortly before whelping does the abdomen hang down as in ascites. But all doubts can easily be set at rest by examination, for the presence of fluid is appreciable to the touch applied in the following manner:

While the patient is standing, lay the left hand on one side of the abdomen, quite low down, sharply tap the other side, directly opposite, with the fingers of the right hand. By this means waves will be sent to the left hand, and be appreciable when they strike it, a sort of thrill being felt, precisely as would be the case were a similar method employed on a rubber-bag filled with water.

Where ascites exists other significant symptoms are present ; and some are attributable to disturbances of the internal organs induced by pressure. The appetite is impaired ; vomiting occurs occasionally ; the coat is harsh and rough ; respiration is embarrassed if the effusion be considerable ; the urine is scanty ; and in a large proportion of cases constipation alternates with diarrhoea. When the quantity of fluid is large, circulation in the legs is obstructed, and in consequence they also become dropsical.

It is not long after dropsy forms before emaciation becomes quite evident ; the lips, tongue and gums grow pallid ; the pulse, at first rapid and feeble, is eventually thin and thready ; the breathing is more hurried ; finally the poor sufferer can no longer lie down, and death soon results from exhaustion, or perhaps suffocation.

Thus far this discussion has been confined to abdominal dropsy when it occurs as a symptom of organic or constitutional disease. Now will be considered a form of dropsy that is caused by the parasite *filaria immitis*.

The embryos of this are scattered through the blood, while the matured generally inhabit the right side of the heart and large vessels, as the aorta and pulmonary artery ; and cases are on record in which the heart and lungs were pierced by these worms. In one instance a nest of them was found in the left lung as large as a native walnut ; while in several others the liver and spleen were studded around their edges with blackish lumps, interspersed with occasional white ones, all about the size of peas, and filled with what seemed to be embryos of this parasite.

The lungs of the victims generally present a peculiar ashen color ; while their livers are dark, and the substance of them is thickened and hardened.

Changes quite characteristic are usually noted in the heart. It is enlarged, and its cavities are distended ; its lining membrane is inflamed or exhibits traces of previous inflammation ; large dark red clots are found on its right side, in which there are usually well developed filariæ, varying in number from three or four up to fifty.

The kidneys also present serious abnormalities, usually in the form of chronic inflammation of the lining membrane ; while here and there in various cavities are discovered embryos of the parasite.

Plugging of arteries by clots, especially those of the lungs, is another frequent condition ; while the veins, particularly of the posterior extremities, exhibit signs indicating that circulation through them is more or less obstructed.

Dropsy eventually manifests itself ; and the effusion, which is a thin amber-colored fluid, takes place into the pleural and abdominal cavities. Rarely, however, is the quantity large at first ; indeed as a rule it accumulates only slowly ; and may not become excessive for even a year or more.

As for the number of filariæ which may be in the blood of a victim, in one case it was estimated to be not less than a million.

The most pronounced symptom of the presence of the parasites is ascites, and those which precede it are not as a rule important or suggestive of the exciting cause.

There is usually a cough of husky nature. The appetite generally remains fairly good until near the end, when it disappears. There is no fever. The character of the pulse varies in different cases. In some it may not for a long time be much affected, but eventually it becomes small, feeble and irregular, as the heart weakens. The bowels are scarcely disturbed. The quantity of urine is excessive; and there is weakness in the back, over the kidneys, which may even approach paralysis. In time emaciation becomes very marked. One symptom, which is quite suggestive of the presence of the parasite, and which manifests itself before the ascites, is a peculiar shortness of the breath, which is intensified at times until there is a striking resemblance to the paroxysms of asthma. The tongue and lips become livid after great exertion; and occasionally it is followed by a convulsion or urgent indications of suffocation.

These parasites are quite common in Indian and Chinese dogs, also in dogs of the southern part of America, especially those used in hunting.

Infection occurs through the mouth. The embryos are passed in the urine, and carried by the air or water into fields or swampy places, from which the parasite makes its way into the system with the drinking-water.

Regarding the length of time victims live after infection, it depends on the number of parasites harbored and their location. While fatal symptoms may appear within a few weeks, in some cases their coming is delayed for a year or more. Generally the time is short after ascites appears, and the majority of victims succumb in from two to four weeks.

Nothing can be done in cases in which dropsy is caused by the filaria; nor is treatment likely to be of lasting benefit when due to other causes, because the diseased conditions on which it depends are quite generally incurable.

In attempting to remove a dropsical effusion it is usually advisable to employ a purgative, and the following acts quite speedily and well:

Powdered jalap, one drachm; bitrate of potassium, six drachms.

This should be divided into powders, in number corresponding to the size of the patient, as follows:

For largest breeds, six powders; medium size, ten; fox terriers and the like, fifteen; toys, twenty.

One powder should be given every three hours until the bowels have acted freely; and thereafter as often as necessary to keep them moving three or four times daily.

The strength of the animal must determine how far these powders can be pushed.

If too weak to bear a purgative, he may be given the infusion of digitalis, three or four times daily, as follows:

For largest breeds, one tablespoonful; medium size, three teaspoonfuls; fox terriers and the like, two teaspoonfuls; toys one teaspoonful.

To overcome existing debility, iron tonics will be indicated.

The diet should be principally milk at first; afterward generous and varied, and consist largely of meat and its juices.

If the effusion is not disappearing under the use of drugs the operation of tapping should be performed in the course of two weeks. Professional assistance must be sought, and the physician should be advised to first place the dog in a standing position, and enter his trocar about the umbilical region, on or to one side of the linea alba. Also to insert an elastic catheter if his canula becomes plugged by any of the viscera falling on it.

OBESITY.

Obesity is essentially a disease of nutrition, characterized by the presence of an excessive amount of fat. The chief alteration is the increase in the fat deposit throughout the body. The blood is increased in specific gravity, also in some of its constituents. The heart shares in the existing trouble, and is overlaid and infiltrated with fat; consequently weakened. The arteries may show fatty changes; the veins are often affected with varicosities; and as a result of cardiac weakness, sooner or later there is a low form of congestion of the lungs, and likely some dropsy of the same; while the liver may be enlarged by fatty infiltration, and the kidneys suffer from chronic irritation or actual inflammation. The stomach shares in the general decline, and there is frequently catarrh of its lining membrane; moreover, dilatation of that organ is common. Finally, various functions are seriously affected, notably the reproductive; and as a rule females that have been good breeders are barren after they become obese.

The common causes of the disease are over-feeding of starchy foods, as breads, various meals, etc., and insufficient exercise. Therefore its most frequent victims are pampered house-pets and dogs kept much on the chain.

Doubtless many other conditions predispose to the disease. For example, after ovariectomy and castration a decided tendency to lay on fat is exhibited. But the influence of such are mild, and in the absence of a diet too rich in the fat producers mentioned, and the indolent habit, the chances of acquiring obesity would be very small indeed.

The remedy is easy. No very abrupt change should be made, but gradually the quantity of food should be reduced, and meat substituted for the starches; and after a time the diet may properly be almost entirely of the former. Ample exercise is imperative, but good judgment must be exhibited

in instituting it. The work must be slow and easy at first. As fat is withdrawn from the heart it is left soft and flabby, and were hard runs encouraged the result might be heart-failure. Therefore, in the beginning, walking should be the exercise, and the distance steadily increased daily. Then short easy runs for a time; and finally, as the dogs come into condition, harder and faster work can be allowed without danger of harmful results.

DIABETES MELLITUS.

Diabetes mellitus is a disease characterized by the appearance of a large amount of sugar in the blood and urine, and progressive loss of flesh and strength.

The true nature of this affection is still undetermined. The microbic theory has been advanced, and has some supporters. The disease has also been variously attributed to abnormalities in the pancreas, liver, kidneys, and process of digestion; which theories are much too complex for discussion herein. Then there is the very simple and comprehensive theory that it is due to partial paralysis of certain nerves going to the liver.

Sugar is one of the natural constituents of the blood, and the same is derived partly from the food—the starches being converted into sugar while in the intestinal canal,—and partly from the liver, which contains a material, manufactured in that organ from animal as well as vegetable substances, that is transformed into sugar on absorption into the blood. In health some of this sugar goes to nourish the body; some, also, is devoted to other purposes, of which as yet but little is known. But if sugar is formed in excess or is not rightly disposed of, it accumulates in the blood, where it acts as any unusual ingredient would, and is thrown out by the kidneys, together with a large quantity of water, which is necessary to hold it in solution.

Strictly speaking, therefore, diabetes is really a blood disorder occasioned by sugar; and it may be even rightly termed blood-poisoning from the same.

It is fortunately only rarely encountered in dogs, hence but little is known of the predisposing causes. There seems, however, good grounds for the belief that when attacking them it is usually attributable to injuries of the brain or spinal cord, especially the former; and that it has a preference for dogs of advanced age, in whom such injuries are most serious because of their low reparative powers.

The symptoms are evolved slowly and gradually, and the disease may be present for a long time before they become sufficiently pronounced to attract attention.

A change in demeanor is generally the first evidence noted, and it may be

a loss of spirits and slight dullness, but in the largest proportion of cases it is irritability and moroseness, characterized by lack of playfulness, and an unnatural disposition to snarl and snap when disturbed.

The appetite is good, and eventually becomes voracious; but notwithstanding this, there is a steady loss in flesh, and in time great emaciation. There is usually increased thirst; yet the urine passed may be but little above the ordinary amount. An irritability of the bladder, especially at the neck of the same, which causes more frequent desire to void the urine, is also present in most cases.

As the disease progresses the mouth is continually parched; the breath assumes a sweetish, mawkish odor; the skin is dry, and eruptions occur on it; there is obstinate constipation, sometimes alternating with diarrhœa; the victim grows more and more dull and listless; and finally death may come during a convulsion or unusual exertion; but generally the vital powers fail slowly, and the last stage is characterized by progressive exhaustion.

In some instances blindness is developed in the course of this disease, in consequence of cataract forming. In some others the hair falls out; while in a certain proportion of cases there is severe chronic bronchitis, or even consumption of the lungs. Ulcerations of the cornea, and large running sores on the body or legs are occasional results.

While many victims finally succumb to diabetes itself, not a few are destroyed by acute diseases that occur as complications; and of these the most common is pneumonia.

Diabetes may be of mild character at first, and for many weeks the general health suffer but little, but the rule is, once it is fixed it is not long before it has assumed a grave form.

The positive sign of this disease is the appearance of sugar in considerable quantity in the urine. And the test for that can be applied by any well informed druggist.

On examination, after diabetes has become well established, the urine is found to be of high specific gravity, and to contain scarcely less than 10 per cent of sugar, and often a greater proportion.

It is well to add here that sugar seldom appears in the urine of dogs except in cases of diabetes. It has been found, however, in dogs that have been for a time fed on a diet of pure sugar. It has also been observed in dams that were nursing, after the pups had been separated from them for a short time, and the milk allowed to accumulate until the breasts were distended.

The outlook in diabetes is always serious, and especially in thin subjects. The fact is of interest that the only condition in which obesity can rightly be considered fortunate is diabetes, for obese animals offer far greater resistance to the progress of this disease than the lean and thin.

The essential treatment in man is to withhold sugar producing foods, as

rice, sago and ordinary breads; and this applied early and faithfully, the malady may be cured or kept at a stand-still for many years.

It would seem that were the diet of dogs suffering from diabetes to be restricted to meat the same beneficent results would be attained. They might in some instances, but unfortunately not in the majority, because the livers of these animals are prone to continue to produce their peculiar sugar forming material. Consequently although the disease may be retarded where the diet is of meats, this measure is not likely to prove completely successful.

Among the accessory foods, which class include fish, spinach and other greens, buttermilk is the most valuable, and the quantity should not be limited.

There are medicinal agents which might greatly favor improvement, but still, where dietetic restriction fails and the graver symptoms appear, the chances are small indeed.

Arsenic has occasionally acted fairly well when combined as follows:

Salicylate of sodium, three drachms; Fowler's solution of arsenic, one drachm; glycerin, one ounce; water, three ounces.

This should be given three times daily, with the food, in doses as follows:

For largest breeds, two teaspoonfuls; medium size, one and one-half teaspoonfuls; fox terriers and the like, one teaspoonful; toys, one-half a teaspoonful.

Decided effects from this medicine are not likely to be observed before it has been given for two or three weeks.

DIABETES INSIPIDUS.

Diabetes insipidus is a chronic affection characterized by constant thirst and an excessive flow of urine, without the presence of sugar; and herein it differs radically from the form of diabetes just described. The specific cause of the disease is not known. No definite or characteristic change from the normal has been noted in any of the important organs which might be involved and have a part in the existing condition, as the kidneys and bladder, but certain peculiarities in the brain and parts of the nervous system have led to the conclusion that it was mainly, or purely, a nervous affection.

It may be induced by nervous influences, as terror, intense anger, or the like; it may also be due to injuries to the head. In dogs, among which it is extremely rare, it has been known, in a few instances, to follow distemper; and beyond doubt other acute infectious diseases are capable of exciting it. In one case occurring in the experience of the writer the disease appeared shortly after a large abscess on the upper jaw had healed.

The prominent symptoms are, constant thirst, the passage of very large quantities of urine, frequent efforts to empty the bladder, and scantiness of the saliva, with consequent dryness of the mouth.

The appetite is generally good, although never voracious, therefore the body remains for a long time fairly well nourished; but eventually the subject gradually loses flesh. The blood becomes slowly impoverished, as indicated by paleness of the lips and tongue. Chorea is sometimes associated.

Recovery only rarely occurs, but sufferers from the trouble may live for several years even after it has become deeply seated. In so far as possible they should be allowed their freedom. Notwithstanding there seems no sound reason for withholding starchy foods from the diet, as a matter of fact they are not as a rule well borne, and the quantity of urine actually lessens under a purely meat diet.

Ergot, salicylate of sodium, jambul, valerinate of zinc, and gallic acid, have all been used, and likely would have good effect if wisely applied. But a remedy that acted well in one case might fall flat in another, hence much skill is required in the selection of medicines; and in the absence of professional assistance it would be advisable to largely restrict the efforts to building up the general health by means of such simple tonics, as iron, quinine, etc.

SECTION XIV.
EXTERNAL PARASITES.

CHAPTER I.
FLEAS, LICE AND FLIES.

THE *Pulex canis*, the dog flea, well nigh makes life a burden to the canine race. Contrary to the general belief, this and the *Pulex irritans*, the human flea, are not one and the same ; and while the latter may infest the dog, the former never attaches himself obstinately to man, although he annoys him with occasional visits.

Both varieties seek sand in which to lay their eggs and hatch out their young ; and during the season in which this is going on it is quite impossible to keep them out of buildings located near sand hills or on sand recently deposited. Consequently he who has his driveway repaired during warm weather is sure to suffer severe infliction. But, fortunately, as sand is worn or rolled down it no longer as nicely serves the purpose of the pests, and they seek more favorable situations.

Fleas suck blood like leeches ; and not content to satisfy their appetites, they inject into their hosts a fluid that is highly irritating. Another unfortunate peculiarity is, that they multiply with exceeding rapidity, the female laying about twenty eggs in as many days, from which the larvæ merge in the course of a week and are speedily matured ; but until they are full grown the mother supplies them with nourishment — sucking blood enough for herself and for them.

For obvious reasons kennels should not be situated near sand hills ; and if sand is used for the foundation or yards it should be rolled or tamped down hard, or be well mixed or covered with air-slaked lime, the same being scattered about the yard during or after a rainfall. By which means the ova or eggs of the fleas would be destroyed. The fact should be kept in mind, however, that lime does not long retain this destructive effect when exposed to the air ; therefore fresh coverings must be applied now and then.

Pine shavings appear to be unpleasant to fleas, consequently the bedding should consist in part if not entirely of them ; and the good effect would be intensified were carbolic “disinfecting balls,” such as housekeepers put up with clothing to keep out moths, freely scattered about in the shavings.

The bedding is even more unfriendly to the pests when naphtha or kerosene oil has been freely sprinkled over it.

Not only are the fumes of such petroleum products highly offensive to fleas, but actual contact with those fluids is fatal. They are not, however, destructive to the ova or eggs.

When a kennel has become infested, a thorough cleaning is first in order, all rubbish, bedding, sawdust, etc., being removed. That accomplished, unless there is serious objection to kerosene oil or naphtha on account of its staining, one of them should be used, with free hand, on every part within. The oil chosen should also be sprinkled about the floor if of wood or cement, or if of bare earth, it will be advisable to cover it with a layer composed of ashes or coal dust and loam, which has been well dampened with the oil in use. And besides rendering the floor objectionable to the pests, the oil will keep the dust well laid for a long time.

Notwithstanding all that may be said of the persistency, wide prevalence, etc., of fleas, in truth owners and caretakers are largely responsible for them, and were the kennels kept clean, whitewashed often, and the inmates well groomed once each day, and washed occasionally with suitable soap, these pests would but rarely intrude, and not remain long when they did so.

Among the applications for their removal from dogs whale oil is one of the most effectual, but it is far from being a pleasant remedy. When used it should be thoroughly rubbed into the hair of the subject, from tip to tip, and allowed to remain on four or five hours, or longer, during which time he should be kept in a warm room, because of the great danger of taking cold while under such treatment. Then, soft soap being employed, he should be carefully washed and dried, and encouraged to take a sharp run.

Crude coal oil, either alone or mixed with equal parts of linseed or other oil, may be used in the same way. Kerosene oil is quite a popular remedy, and can be safely applied by means of a fine comb, and thus conveyed to all parts of the coat without any considerable quantity reaching the skin; which it is liable to irritate.

Among the soaps on the market are some reputed to be made of whale oil, and washing with them seems to be followed by quite as good results as by the application of either of these oils. Strong carbolic soap is also quite efficacious.

Naphtha as a local application is of high repute with many. It is applied with a brush, every part of the coat being lightly painted.

The common commercial benzin is an agent of far greater value in medicine than is generally appreciated. There are but few fluids which "strike in" so deeply, therefore it is especially useful in diseases of the hair in which the roots are involved. It is speedily destructive to fleas and other external parasites. Furthermore, it is not irritating, and is perfectly safe for external use.

Finally, it costs but a mere trifle and will not injure or stain the finest fabrics; which fact specially recommends it for use on house dogs when they become infested with fleas, lice, etc.

The sulphuret of lime is destructive to all kinds of vermin; and a weak solution of it can be made by boiling two pounds of the flowers of sulphur and one pound of unslaked lime in two gallons of water. The lime should be first put into the water and slaked, then the sulphur should be slowly added and carefully stirred in; and finally the mixture be boiled down to one gallon. After which it should be allowed to stand until it has settled.

The clear fluid having been poured off into a washing tub, the infested dog should be stood in it and drenched, and afterward allowed to dry without rubbing.

A very inexpensive dip can be made of the crude carbolic acid. It costs about 35 cents per pint, and half this quantity added to water will make a washing tub full of safe and efficient flea-destroyer, which will keep indefinitely without losing its strength. But this must not be confounded with the carbolic acid in common use, of which there are several kinds. First, comes the pure in the form of white crystals—so susceptible to moisture that they soon fuse into a hard mass. Then the carbolic acid usually found in drug shops, which is at least one remove from the first in the matter of purity, although the two outwardly so closely resemble one another the difference is scarcely appreciable. The next remove is a nearly colorless liquid which is generally employed when large quantities are needed to disinfect cesspools, sewers, etc. After this comes the crude acid, the kind herein recommended, a syrupy fluid of deep brownish color—nearly black—and really only about one-half carbolic acid, the most of the remaining ingredients being worthless substances.

When diluting crude carbolic acid it is advisable to use an alkali, and the common soap of the kitchen will answer every purpose. One pound of soap having first been dissolved in about one gallon of hot water, half a pint of the crude carbolic acid should be added, and thoroughly mixed by vigorous stirring. Then the whole should be poured into a tub or barrel holding about fifteen gallons of water.

The destroyer is now ready for use, and can be applied with a sponge, or dogs can be dipped in it—in which case, care must be taken to prevent the solution from getting into the mouth, nostrils or eyes.

The duration of the bath should not be over half a minute; and after being permitted to run about for five minutes, the dogs should be dipped in a tubful of clean water, or rinsed off by means of a garden sprinkler, and then allowed to dry themselves in their own way.

Strong hardy dogs would scarcely need rinsing, but still it is a wise procedure, for some forms of the crude preparations contain more carbolic acid than others, and poisonous absorption might possibly take place; moreover, if

often applied and allowed to dry on, the solution would likely make the hair dry and brash.

This crude carbolic solution is not only destructive to fleas and other troublesome insects but preventive and curative of the most common form of mange and other parasitic diseases; hence its use about twice every week in summer is likely to prove highly beneficial in a variety of ways. But, for obvious reasons, it is available only in warm weather or where the kennels are comfortably heated in winter. And since nearly all such agents are more or less prejudicial to the coat, it should be used sparingly, if at all, on dogs being made ready for shows.

As a vermin destroyer, what is generally accepted as pure carbolic acid is sometimes used in a stronger preparation composed as follows:

Carbolic acid, one-half an ounce; glycerin, one-half an ounce; laudanum, one ounce; bicarbonate of potassium, one drachm; water, one and one-half pints.

In using this pour a little into a hand-basin, and with a small sponge rub it through the coat to the skin.

Of the various agents that have been recommended for the destruction of fleas the Persian and Dalmatian insect powders appear to be the most popular. They are often destructive, yet by no means positively so in all instances, and in the exceptions they have simply a narcotic effect, which lasts for a few hours only, when apparently complete restoration occurs. Nor can they be relied upon to keep dogs free from the pests, for they are soon shaken off, with all their constituents, consequently must be used once, and perhaps twice, daily to effect lasting benefit.

A bellows is the best means of application, or in its absence a tin box with perforated cover can be used. And in every instance the powder should be well worked into the hair, and down to the skin, with the fingers, the subject under treatment the meanwhile standing or lying on a paper, which, with what falls on it, should be burned, that all the fleas may be with certainty destroyed.

A dip may be made of the insect powder in the following manner:

Into a small jug pour one pound of the powder and three pints of cheap alcohol. Cork tightly, to prevent evaporation, and shake often for three days. Then obtain a tin funnel large enough to hold the contents of this jug, also a three gallon demijohn. Lightly pack the bottom of the funnel and its neck with absorbent cotton, and insert it into the mouth of the demijohn. Shake the small jug and pour its entire contents into the funnel. The fluid portion, which is the tincture of the insect powder, will slowly filter through the cotton, and as it does so, keep the funnel full of water until sufficient has passed through to fill the three gallon demijohn. And each time water is put into the funnel the muddy mass at the bottom of it should be lightly stirred, otherwise

the filter will be choked. What remains in it should be thrown away.

By the operations described, which may take two or three days, all the virtues of the insect powder will be washed into the demijohn.

The tincture of the powder, which that now holds, is too strong for a dip, and should be diluted with two parts of water. That is, assuming that the dog is small and a three gallon dip quite large enough, to make it one gallon of the tincture should be added to two gallons of water.

The effects of this solution are far more lasting than those of the dry powder, and a dip every two or three days ought to secure freedom from fleas even in most troublesome times; but a dip daily would be perfectly safe. And were the solution sprinkled over the bedding and about the kennels, fewer dips would be required.

It stains very light coats, but the discoloration washes off readily after having dried.

Mature dogs are not often infested with lice, but puppies are frequent victims, and the favorite location of this vermin is at the back of the neck, where they appear as small steel gray specks.

Lice may be destroyed by the remedies recommended for fleas, but where the infested subjects are puppies it is best to use an emulsion made of kerosene oil, two parts, and fresh skimmed milk, one part. This should be prepared as follows:

Heat the milk, and while hot put it into a bottle considerably larger than required for the mixture, together with twice as much oil as milk; then shake the whole vigorously for several minutes, by which means the ingredients will be thoroughly mixed.

As soon as it has cooled sufficiently apply the mixture with a sponge or stiff brush, such as painters use, and with considerable force, that the skin may be well bathed. On the day following it will be advisable to employ a fine-tooth comb on the parts treated; and if any of the vermin are yet alive, a second application of the milk and oil will be indicated.

Druggists have on sale the crude petroleum oil, which is destructive of lice, and can be used freely with perfect safety. It should be applied to the hair with a brush, be allowed to remain on for three hours, and then washed off with warm water and soap. This operation should be repeated on three successive days, when the nits may be removed by combing the hair very carefully with a fine-toothed comb wet with vinegar.

Another agent, which will immediately destroy all varieties of lice and their nits, and of which a single application only is necessary, is the oil of sassafras.

In using this care must be taken to keep it from the eyes or mouth, for it will burn mucous membranes painfully.

A more expensive preparation, but much to be preferred for use on house pets, is composed as follows:—

Calomel, two grains; alcohol, three drachms; chloride of ammonium, fifteen grains; rose water, sufficient to make three ounces.

This should be applied once daily.

Of the flea-destroyers adapted to lice on advanced puppies or mature dogs, benzin is the best.

Ticks occasionally infest dogs; and while still on the surface require practically the same treatment as lice and fleas; benzin being one of the most active destroyers. They, however, work their way through the skin; and after gorging themselves, often find it impossible to return. They consequently die; and then, being more or less poisonous, cause inflammation of the adjacent tissues and swellings of considerable size; for which the only treatment is the knife.

Flies may properly be included in the list of troublesome insects. To them the odor of tar is highly objectionable, therefore washing now and then with soap containing it is recommended. A strong suds should be made, and without being rinsed after being washed, the dogs should be allowed to dry themselves in their own way.

Aside from common flies there are the so-called gad flies of tropical countries, also "wood," "deer" and "shore" flies, familiar to sportsmen; all of which cruelly torment the dog.

When in the field any approach to complicated and elaborate treatment is not possible, and condensed remedies only are likely to be carried about. The tincture of quassia is quite an efficient protection against the larger external parasites, as fleas, flies, etc., and a four-ounce bottleful of it should be in the hunting kit, to be applied freely to the coats of the dogs, with the hands or a sponge, if either of such pests trouble him.

Scratching excited by vermin causes eczema, which should, of course, be appropriately treated after the vermin have been destroyed.

In every instance in which a kennel has become infested with any of the troublesome insects, the bedding should be at once destroyed, the quarters thoroughly cleaned, fumigated or disinfected with suitable means, and the entire inside treated to a coat of whitewash, which should enter every part, crack and crevice, or to a drenching with kerosene oil or naphtha.

SECTION XV.

SYMPTOMS AND TREATMENT OF POISONING.

CHAPTER I.

ESSENTIAL PRECAUTIONS.

PENALTIES having been fixed for his crime, some protection against the dog poisoner has been afforded in most civilized communities, but he has not been stamped out of existence. Cases of purely accidental poisoning also now and then occur. Considering the unfortunate conditions still existing, the reader should be fortified with at least a fair general knowledge of poisons, the symptoms they excite, and the agents required to counteract their baneful effects.

The author duly appreciates that only by years of patient study and experience can there be acquired a perfect familiarity with the properties of medicines, the diseases to which they are respectively applicable, and their adaptability to the peculiarities of the individuals. He also recognizes the fact that, as a rule, some danger is to be apprehended when those who have not had such acquaintance undertake their use; yet in his consideration of the various diseases, he has endeavored to clearly define the medicinal and other treatment required in each; and he trusts that by careful and painstaking handling of his subjects all possibility of his readers straying and making harmful mistakes have been obviated. Nevertheless he would urge the seeming paradox that all powerful drugs, while capable of great good, may still be productive of the most harmful results. In other words, all such agents under certain conditions are poisons. They ought not, therefore, to be trifled with; and the directions given herein should be invariably followed. Then, and then only, can the medicines advised be administered with absolute safety.

To encourage care and accuracy, and thereby lessen the liability of accidental poisoning, the following general rules are laid down:

No one who cannot read should ever be permitted to pour out a dose of medicine if there is more than one bottle of drugs in use.

All bottles containing poisonous agents should be labeled *Poison*; and the same label should be on bottles which contain strong medicines designed for external use only.

Before pouring out, or otherwise preparing a dose of medicine, look carefully at the label.

No medicine should be kept in a bottle or other receptacle without a label.

If a bottle which has contained one medicine is wanted for another kind, let it be thoroughly washed with hot water; and, on putting the new medicine into it, properly change the label at once.

If there is any doubt about the medicine in a bottle, throw it all away.

Use great care in dropping medicine. When uncertain as to the accuracy of a dose, throw it away and drop another.

In dropping from a bottle, first moisten one edge of the top with the contents, and then, holding and tilting the bottle in the right hand, with the left very slowly and cautiously withdraw the cork or stopper, until a drop rolls out. After it does so, at once push the cork in, and repeat the process again and again, until the right number of drops has been obtained.

A glass dropper can be bought for a trifle, and it is not only safe but saving of labor and time.

All drugs require a certain period to act in, and must not be repeated until the proper interval has been allowed. This is rarely less than two or three hours where they are given by the mouth.

Remember that a dose of medicine can be repeated if necessary, but cannot be recalled after having been once given. Therefore it is better to administer too small rather than too large doses.

The following facts have a bearing on the subject of poisoning:

Some poisons more rapidly enter circulation and manifest their characteristic symptoms than others.

Poisons taken into the stomach when it is empty necessarily act much more speedily than when it is full. Thus, if that organ is loaded the appearance of poisonous symptoms may be delayed some hours.

Liquid poisons as a rule act much quicker than those in solid or powdered form.

Sleep may retard the action of some poisons.

Since certain diseases set in suddenly and rapidly terminate fatally, there is a possibility of such being mistaken for cases of poisoning.

Poisons may be divided into two classes. First, those which are of irritant or caustic action, and produce death directly and by causing, primarily, intense inflammation of the mouth, throat, passage downward and the stomach, or of the intestinal canal. Second, those which do not irritate the mucous membrane that they come in contact with, but on reaching the stomach are absorbed, and enter circulation and poison the blood, or excite fatal action in some of the vital organs to which they are conveyed.

At least one poison, dropped on the tongue, in powdered form, generally produces almost instant death. As a rule, however, even when the poison is

a liquid and the stomach empty, absorption does not occur and poisoning take place within ten minutes. While were the same poison a powder and enclosed in a piece of meat, it might not cause death for nearly an hour.

In the great majority of cases in which dogs exhibit suspicious signs, it is quite difficult to decide positively whether or not they have been poisoned. And in cases manifestly of poisoning it is even more difficult to determine, with absolute certainty, the poisons that have been taken. Of the characteristic symptoms, those produced by strychnia are very pronounced, and yet the same may be excited by worms and a variety of other causes. Therefore, for a time at least, after his dog had fallen victim to that poison it would scarcely be possible for the average owner to fix upon the precise cause of the convulsions with which he had to contend. Another unfortunate fact is, that in most cases of poisoning the injury is inflicted while the dogs are not under observation, and likely when far from home; consequently several hours have generally elapsed before their signs of distress are discovered. Then, as a rule, the poisons have been absorbed from the stomach and entered circulation, and the difficulty of combating their baneful effects is much greater than it would have been during the first few minutes, or possibly hour.

These disadvantages under which one must labor while making a diagnosis in suspicious cases should be duly appreciated, for those who were ignorant of them, assuming that positive symptoms are always exhibited, would scarcely detect instances of poisoning before the chances of a cure had long gone by.

When a dog is taken suddenly ill and his symptoms suggest poisoning, to determine his whereabouts during several hours previous is the first important step to be taken. If found that he had not been out of the house or his yard, manifestly the chances of having been poisoned would be very small indeed, unless there were unfriendly neighbors, or complaints had recently been lodged against him for barking or other misdemeanor. Whereas had he been at large, of course his opportunities for picking up a poison would have been many.

Aside from strychnia, there is not a poison from which dogs are likely to suffer that produces, invariably, symptoms that are plainly indicative of the precise cause. That powerful agent speedily excites convulsions; but other harmful drugs give rise to quite vague and ill-defined symptoms which may be attributable to various diseases as well as to different poisons. For instance, arsenic produces violent inflammation of the stomach and intestines. Precisely the same condition follows the taking of mercury, phosphorus and other irritant poisons, of which there are many; and the symptoms induced are also identical. Excepting, therefore, when poisoning has been caused by strychnia or some of its kindred, as *nux vomica*, it is rarely possible to do more than determine merely that poisoning has occurred, and that the noxious agent belongs to one of several classes; while to fix upon the actual poison must be quite impossible.

CHAPTER II.

INTENTIONAL POISONING.

CONSIDERING the poisons which might be given to dogs, the most powerful is the cyanide of potassium. This is identical with prussic acid, and acts precisely like it. It is a white, granular powder. When given to dogs it is very generally intentional; and it is quite as merciful a means of destruction as any other known, producing as it does a painless death, and generally acting fatally within a minute. It is the poison commonly employed by officials in cities whose duty it is to weed out unlicensed dogs; and in using it they merely drop a small quantity on the tongue. There is no antidote for this poison; and considering its almost instantaneous action, one could not be used if found.

The symptoms of strychnia poisoning have been considered at length with Convulsions, therefore it is not necessary to describe them here. At once they are noted, if an emetic can be procured without any delay it should be administered. Then the caretaker should immediately begin to force common lard down the throat of the sufferer, and persist until he has succeeded in disposing in that way of a goodly quantity — indeed a pound if possible and the dog is of the largest breeds. If there must be even a few moments' delay with an emetic, and the lard is at hand, the latter should be relied upon.

It is a safe rule always to empty the stomach when a suspicion that it holds poison exists, unless an absolutely infallible antidote can be as quickly obtained and administered as an emetic. The results of a series of experiments conducted on dogs have seemed to show that simple lard is an antidote for strychnia. But while it is doubtless of great value and efficacious in a large proportion of cases of poisoning by that drug, as yet the experience with it has not been sufficiently varied and extensive to warrant implicit confidence in it as an antidote. Hence the advice that an emetic be given first, if possible, without delay. If one has been administered and vomiting occurs, the lard treatment should be stopped only during the expulsive efforts of the patient; and as soon as they have ceased, be as vigorously applied as before.

Convulsions indicate that at least some of the poison has left the stomach and entered the blood. How long a time must elapse before such change has taken place is problematical, and depends upon the existing conditions — namely, whether or not the stomach contained much food when the poison entered it — and it might be a little less than half an hour, or several hours.

The occurrence of convulsions might be construed as positive evidence that the poison, having been absorbed, was beyond the influence of an emetic or lard, but while some of it must have left the stomach considerable might yet remain therein, and there still be work for those agents to do. Again, lard will have its beneficent effect even after the spasms have commenced; and in one instance in which four grains of strychnia had been given a dog and lard administered after the convulsions had set in, he was up and about and apparently fully recovered in the course of thirty-five minutes. It follows, therefore, that it would be a wise plan to try the lard even if so long a time had elapsed since strychnia was taken that any effect from it seemed scarcely possible.

While it is being employed an assistant should be preparing the means to stop the spasms. For that purpose the hydrate of chloral must be given by injection, as advised in section devoted to the consideration of Convulsions; and ether or chloroform also be administered if necessary.

Tobacco is a resort in such emergencies, which is not appreciated as it deserves. It is a powerful emetic, also produces muscular relaxation in cases of spasms. Hence it may be considered one of the best antidotes for strychnia; and should be perfectly safe when properly used. If the hydrate of chloral and ether or chloroform control the spasms, they may be of course relied on; but if they fail, as they are quite liable to do, — the convulsions returning as soon as their effects have passed off, — tobacco tea should be tried. Selecting a cigar of fairly good quality, one-half of it should be broken into half a tea-cupful of hot water, and boiled in the same for about five minutes. It should then be injected into the rectum, the entire quantity being administered if the suffering dog is of medium or large size breed, and one-half if he is of small breed or a toy. The hydrate of chloral should also be used at the same time; and it may be put into the tobacco tea. If decided improvement should not occur in the course of half an hour, the same dose ought to be repeated.

Strychnia, in poisonous doses, causes a rapid chilling of the body, hence the sufferers should be wrapped in hot blankets, and the heat in the same be kept up by means of water-bags, hot bricks, flatirons, or something of the sort. It leaves its victims prostrate, if not in a condition bordering on collapse, therefore whiskey, or brandy, and hot milk should be administered as restoratives as soon as the convulsions have ceased and swallowing is possible; and thereafter for a time be given at frequent intervals.

It is generally advised that the bromide of potassium be combined with the hydrate of chloral. There can be no objection to so doing, but the fact is plain that the value of potassium in such cases has in times past been greatly overestimated. As for injections of morphia into the intestine, also recommended by some authors, they are wholly unreliable in their action. Were morphia given hypodermically, it might, however, have an appreciable

effect; but at least eight or ten grains would be required to combat one grain of strychnia.

From the employment of the nitrate of amyl much may be expected in strychnia poisoning, and indeed in almost every convulsive disorder; but it must be used cautiously, for it has a very powerfully depressing influence, which is even greater on dogs than on mankind. Inhalation is the form of administration. From three to five drops on a handkerchief is quite enough to use in ordinary cases in which the patients are of medium or large size breeds. It should be held close to the nose for about twenty seconds, and then be withdrawn. After about the same interval it may be returned, provided the heart does not beat violently.

Before going further, a brief consideration of a few important facts bearing on emetics may be of material advantage to the reader.

Sulphate of zinc, either alone or in the wine of ipecac, is one of the best emetics for general use. For largest breeds the dose is twenty grains in about two tablespoonfuls of water. If the wine of ipecac be added, the quantity of the latter should be one tablespoonful.

Dogs of medium size might safely take the same doses, but it were best to reduce them about one-third; while one-half would be right for pugs and the like, and one-fourth for toys.

In the absence of special drugs and preparations, common mustard or table salt can be used.

Of the former the dose is a teaspoonful in about a teacupful of warm water.

The dose of salt is a tablespoonful. This also can be given in a teacupful of warm water; but an admirable vehicle is butter, sufficient of which should be used to hold together the essential quantity of salt.

The foregoing doses are for the largest breeds, and ought to be reduced according to the size of the patient, as when the sulphate of zinc and ipecac are used. Failing to cause vomiting, they should be repeated at intervals of ten minutes until that effect has been produced.

But dogs cannot swallow when in convulsions; and while medicines may be put into the mouth, to trickle down the throat into the stomach, this is a very slow process indeed, for only a little at a time can be safely administered; and if the quantity of emetic to be given is large, as is the rule, it will be necessary to wait for an interval of freedom from the spasms, which is often a long time in coming. It is therefore far better, if possible, to introduce the medicine under the skin by means of a hypodermic syringe. Any physician can do this; and in case one is called, he should be requested to so administer the hydrochlorate of apomorphia. Vomiting will then be produced in from five to twenty minutes. But obviously it is best always to be provided against accidents, especially if the essential precautions are easy and inexpensive; therefore all owners of large kennels are advised to add hypodermic syringes

and small bottles of compressed tablets of apomorphia to their outfits. The former can be bought for one dollar, and the latter for about twenty-five cents. Tablets of various strengths can be obtained, and those which have about one-twentieth of a grain each must be the most convenient for general use. One such tablet, dissolved in ten or fifteen drops of water, would be right for small breeds; one tablet and one-half for those of medium size; and two tablets for the largest. Fairly small doses for use hypodermically are recommended, because large doses when administered to dogs often fail of their purpose and give rise to great disturbance of circulation, and even to paralysis.

CHAPTER III.

ACCIDENTAL POISONING.

ARSENIC is rarely given intentionally for the purpose of poisoning, but now and then it is taken up by dogs in some of the various preparations intended for rats.

It is irritant-narcotic in its action; and the symptoms manifested usually begin to appear in the course of an hour after it has been taken into the stomach. They are as follows: Depression of spirits and general weakness; heat of the throat or a burning pain, that causes constant hawking; great thirst; redness and some swelling of the mucous membrane which covers the tongue and lines the mouth; severe pain in the stomach; enlargement of the abdomen, which is also drawn tight and hard, and painful to the touch; violent retching and vomiting; diarrhœa attended with much straining and discharges of blood or brown-colored matter; great restlessness; and quickened breathing. In cases which terminate fatally the symptoms all grow rapidly worse; prostration becomes more and more pronounced; ere long the skin, at first hot, is cold and clammy; the pulse is small and frequent; convulsions usually set in, and are often followed by paralysis; finally death results; and in most cases it comes in the course of twenty-four hours, although in rare instances the sufferings are ended within an hour, while in cases still more rare they are prolonged for a week or more. There is considerable variation in the symptoms of arsenical poisoning, but the foregoing are the most constant and marked.

The antidote for arsenic, which neutralizes the poison and renders it harmless, is the hydrated oxide of iron. Could this be obtained and administered without any delay, recovery might invariably take place speedily in all cases of arsenical poisoning. But it is seldom at hand; moreover, even were a chemist only a short distance away, he would require time to prepare the remedy, for it ought to be fresh, consequently ere sufficient quantities could be forced into the dog the poison must have done much baneful work.

As the materials for making this antidote are kept in most large kennels, it will often be easy to prepare it at home; and the method of procedure should be as follows:

Put into a bowl half a cupful of the tincture of the chloride of iron. Follow it with one quart of water, and stir well with a stick. To one-fourth of a

cupful of aqua ammonia add sufficient water to fill the cup. Turn this slowly into the bowl of iron and water, and stir constantly. A thick powder will be thrown down. Then pour the whole on to a strainer of muslin or other very thin material, and throw away the fluid. Return the powder to the empty bowl and fill the same with cold water. Stir well and strain as before. The powder, having now been well washed, should be forced into the dog as rapidly as possible.

Magnesia has some neutralizing action on arsenic, and in the absence of the iron preparation might be given freely. And its effect must be somewhat beneficial even if quite a long interval has passed since the poison was taken.

The essential after-treatment is practically the same as required in cases of severe inflammation of the stomach. Of that the use of hot milk and alcoholic stimulants should be a part, to combat the prostration and tendency to collapse.

Unless a reasonable amount of caution were displayed, some external applications might result in poisoning. Of the agents which appear in such, carbolic acid is probably the most common. The symptoms of poisoning induced by it are great depression; trembling and twitching of the muscles; difficulty in getting about, indicative of threatened paralysis; diarrhoea, with discharges sometimes bloody; dark, smoky urine; coldness of the body and legs; burning of the mouth, throat and stomach; abdominal pain and tenderness; lastly, insensibility; total paralysis; convulsions; and collapse, ending in death. Were the victim of large breed, and did he swallow a tablespoonful of very nearly pure, liquid carbolic acid, the chances are that he would not live more than half an hour or an hour.

Were they at hand, and could they be given immediately after carbolic acid had entered the stomach, much might rightly be expected from alcohol and the sulphate of soda. Indeed by some experimenters the former is considered an absolute and immediate antidote to the poison; while the latter, dissolved with a small quantity of water and given frequently, forms a harmless mixture with the carbolic acid. In the absence of either of these there should be poured into the stomach of the victim of the poisoning, in generous quantities, vinegar and water—in equal parts—raw eggs and water, or sweet oil, for the purpose of shielding the lining of that cavity and the intestines from the poison. Whiskey and brandy would also be indicated to prevent collapse.

Small, long haired and very delicately constituted dogs might absorb sufficient of the poison from a bath were very strong carbolic acid soap used; and such accident might possibly occur from a dip made of the acid or some of its preparations, in the names of which phenol usually appears. In that case the poison would be beyond reach of the antidote, and the requirement be to stimulate freely.

In the dressing of wounds iodoform is often recommended; and it might

be absorbed or the powder licked off with poisonous results. Where a fairly large quantity has entered the system, narcotic effects are produced. There is more or less prostration, with symptoms of intoxication, the dog tottering, and inclining to one side, with his head hanging low. There is loss of appetite, but no vomiting. Unless more iodoform was taken, these signs would disappear readily, and all be gone in twenty-four hours. A larger and usually fatal dose causes great excitation, with irregular breathing, and strong and full pulse; there are convulsive movements, during which the head is bent backward, as in lock-jaw, with twitchings of the paws, and especially those behind. In some instances the signs of poisoning are, dulness, deepening into stupor, contracted pupils, abnormal quiet or restlessness, suppression of the urine, convulsions and collapse. In mild cases, as for instance where only a little too much iodoform has been applied to a wound daily for several days, the principal symptoms are general depression and disinclination to move about, quickening of the pulse, and loss of appetite. In such, did the poisoning continue, the pulse would likely in time become so rapid—150 or 180—it could only be counted with difficulty, and collapse would speedily follow.

The treatment usually required is to give hourly the bicarbonate of potassium in from five to ten grain doses, and stimulate with whiskey or brandy and the aromatic spirit or carbonate of ammonia. The smallest dose of the potassium stated would be right for all dogs under medium size. In extreme and desperate cases in which the brain is paralyzed, as it were, atropia might be tried, and be administered hypodermically.

This opportunity is favorable for emphasizing the fact that in dressing cuts and other wounds one-sixth of a teaspoonful of iodoform is all that ought to be used on one of the largest breeds, and much less on the small breeds, for were more applied, there must be danger of poisoning by absorption.

Being an ingredient of some preparations intended for the destruction of certain insects, poisoning by phosphorus is possible. The symptoms produced are great restlessness, pain in the throat and stomach,—which may account for the howling and whining—abdominal tenderness, intense irritation of the mouth and throat, thick and copious saliva, violent vomiting, and sometimes purging, coldness, prostration, and either convulsions, paralysis or stupor before death. The end may come within a few hours or be delayed four or five days. In the lingering cases, after two or three days, the lining membrane of the mouth loses its bright red color and becomes dirty-yellowish. If the skin and “whites” of the eyes also exhibit this jaundice tendency, the evidence of phosphorous poisoning is very strong indeed.

Less than a grain of phosphorus would doubtless kill a dog of large breed. Were the fact that phosphorus had been taken into the stomach at once known, the poison might be neutralized by the permanganate of potassium, the proper dose of which is four grains for largest breeds and one grain for the smallest.

Each dose should be dissolved in about a wineglassful of water and poured down the throat. To repeat in twenty minutes, and perhaps several times, would be advisable in reasonably sure cases.

In the absence of this remedy the essential treatment would consist of the use of an emetic, followed by large quantities of tepid water, with magnesia, chalk, whiting, charcoal or even flour stirred into it. Old and non-rectified turpentine has been considered an antidote. A very efficient emetic for these and other cases of poisoning is the sulphate of copper; and the dose is from two to ten grains—the former for toys and the latter for largest breeds. It is best given in powdered form, rubbed up with sugar; and if dropped far back upon the tongue it should soon make its way into the stomach.

Almost any of the various bland oils, as sweet oil, linseed oil, etc., can be advantageously given in most cases of poisoning, whatever be the noxious agent, but those in which phosphorus has been taken are notable exceptions. Aside from turpentine, no oil would be allowable, for all others dissolve the poison, and so render its action much more rapid.

The sulphate of copper is the popular emetic with some breeders, and as a rule in the right doses it is as safe as it is efficacious. There is, however, a possibility of its failing to produce vomiting; and if much has been given, poisoning from it may then occur. Hence it will be well for the reader to know that if it cannot be expelled from the stomach within twenty minutes the whites of eggs ought to be administered in generous quantities, to neutralize the poisonous effects of the copper.

Mercury in its pure state is not poisonous, but several of its compounds are so; notably corrosive sublimate. Other preparations which are now and then used on dogs are the various mercurial ointments, red precipitate, white precipitate, etc. Corrosive sublimate is a deadly poison, and probably two or three grains would kill a dog of largest breed. It is rarely given internally, but is frequently used as a germicide, disinfectant and antiseptic; for of all like acting agents it stands first, because of cleanliness, efficiency, convenience and economy. In dressing wounds the solution of it commonly employed is seldom over 1 to 2000. That would be practically safe from poisonous absorption unless applied continually to a very extensive broken surface, and in great quantities; but for stronger solutions, as 1 to 1000, to be absorbed and do harm is possible. As for mercurial ointments, were they used freely and on parts which the dog could reach with his tongue, he might lick off enough to make him ill.

The symptoms of poisoning by corrosive sublimate when taken in by the mouth much resemble those of arsenic and other irritant poisons. There is burning in the mouth, throat and stomach, pain in the abdomen, excessive thirst, vomiting, and purging of bloody mucus, accompanied by straining, extreme prostration, signs of paralysis, sometimes stupor, and often convulsions

before death. The end may come even within an hour, but very generally it is delayed for a day, or possibly two days, after the poison has been swallowed.

Vomiting usually occurs quickly, otherwise an emetic might be required, although in most cases the whites of eggs, in a little water, given in generous doses every two or three minutes, would be quite certain to speedily produce it. The greater the quantities of whites of eggs administered the better. If eggs are not at hand, milk, flour and water, or flour and soft soap thinned with water, make quite efficient substitutes. Alcoholic stimulants are required to overcome the great depression.

Some of the preparations of lead are occasionally used on dogs, and poisoning by them is possible, but cases of the accident are very rare indeed. The symptoms induced are, violent vomiting and purging, with severe abdominal pains, followed by prostration. Death commonly occurs in from one to three days where the quantity of poison taken is large.

One of the most inert forms of lead is the sulphate; hence sulphuric acid and its salts, as sulphate of magnesia, known as Epsom salts, are antidotes. The latter, dissolved in water, is promptly effectual. After it has been administered and followed by an emetic, raw eggs in milk should be freely given.

In kennels in which the drinking water is from the common supply, as in all cities and large towns, the danger of slow poisoning by lead is far greater than generally supposed. As a rule the water is conveyed long distances through lead pipes, and but rarely can kennel-men be made to understand the importance of allowing pipes to completely empty every morning before any drinking water is drawn. Nor can they be made to accept the right estimate of the length of time the water must run before all the old and stagnant has been drawn off. Using as an illustration an ordinary house of three or four stories located in a city, and with only a sidewalk between it and the street. Now so many feet of the lead pipe have been used in plumbing such a house, before the first water drawn in the morning from a faucet of ordinary size in the third story could be fresh, it must run for nearly half an hour; and the water drawn ere that must be stagnant, stale, and more or less impregnated with lead. Kennels being usually at quite a distance from the houses, oftentimes the faucets must be open for an hour before water comes that is suitable for drinking purposes.

Animals as a rule are very susceptible to the action of lead, and within the experience of the author, cases of colic have occurred where the lead taken up was from only fairly small freshly painted surfaces. It is therefore reasonable to believe that in not a few kennels the inmates of which do not thrive well, the fault is in the drinking water.

The most pronounced symptoms of slow poisoning by lead are constipation, loss of appetite, and, in advanced cases, severe attacks of abdominal pain. Ere that comes, however, the hair is dry, rough and staring; the skin has lost

much of its softness, smoothness and elasticity, and is dry, hard and rough; while attacks of eczema are frequent.

The remedy is easy, and unless the poisoning has gone too far, under merely a change in the water supply, recovery should take place promptly. If medicines are required, Epsom salts should be given daily, in small doses, until the bowels are moving freely and regularly; and thereafter the aromatic sulphuric acid should be constantly put into the drinking-water. The quantity must be small, however—only a few drops in each bucket—otherwise the dogs would detect it.

In all large kennels, means to combat at least the most common poisons should be at hand. Since it will be only rarely possible to identify the special poisons that dogs have taken up, it is advisable always to have some general antidote which may be administered in doubtful cases, with reasonable chances of proving effectual. As such the following is recommended:

Calcined magnesia, powdered charcoal, hydrated oxide of iron, of each equal parts. This may be mixed with water, and given in generous quantities even in suspicious cases, for it is incapable of doing harm if it fails to do good.

Dogs are endowed with almost marvellous powers of combating poisons that result from decomposition, otherwise they must soon succumb to decayed meat or bones. While perfectly well they seem eminently capable of disposing of all such poisonous matters; but let the digestive system become disarranged, and some of the important organs which constitute it fail to do their work properly, then poisoning must be easy. And that such were not in good working order might not, of course, be always apparent. These facts should be kept in mind, and in so far as possible the food given be above suspicion. Where there are a number of dogs and broths are fed, occasionally some of the food must be left over and kept for the next day's feeding. Breeders should know that in warm weather, meat broths and soups change quickly; and under certain conditions there develops therein a virulent poison. Such meat foods after being kept over night in hot weather should not, therefore, be given dogs until some precaution has been taken. Boiling kills the poison in question; therefore recocking is indicated. Of course dogs in a wonderful degree resist food poisons; and a poison which would make a man seriously ill might not injure his dumb friend. Still, just how far this resistant power extends is not known, and there is reason to believe that not a few of the now mysterious visitations of sickness are due to food poisoning. This rule of recocking in hot weather the meat foods left over from a meal has been imperative in the author's kennel. On one occasion it was not conformed to, but a cold soup, which had stood twenty-four hours in the kettle, was fed out. The following day all the dogs which ate of it had a bad diarrhœa come on; and as they were well the day previous there was good reason to suspect poisoning of the sort mentioned.

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